Third-party logistics in Nigeria: the development of a Nigerian third-party logistics decision support framework

By

Obinna Okeke

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Abstract

This research is an investigation into the practice of logistics outsourcing in Nigeria. Preliminary findings indicate Nigeria has a growing yet immature third-party logistics market. Hence, the research investigated the possibilities for growth and maturity of the third-party logistics market in Nigeria. The research also developed a decision support framework, which is useful for helping companies in Nigeria to decide whether to outsource or further outsource all or some of their logistics activities. The decision support framework was developed from the findings of the research into the potentialities of the Nigerian third-party logistics market. An extensive literature review was conducted which explored the various areas, branches and theories of logistics and supply chain management, outsourcing generally, logistics outsourcing and the practice of logistics outsourcing in developed and developing countries. The identified gaps include the dearth of research into logistics outsourcing in developing countries including Nigeria; the dearth of a multi-sectoral research in logistics outsourcing in Nigeria and a lack of research into individual logistics outsourcing activities such as warehousing and inventory management in Nigeria. The literature review also showed that companies in Nigeria outsource among other reasons to share risks. The research used a mixed method design that employed both qualitative and quantitative research methods. A qualitative content analysis comparing the barriers, challenges and problems of logistics outsourcing between the UK and Nigeria was conducted. The findings of the content analysis indicate that poor information flows, management/risk, and exposure of 3PL's customer secrets to competitors, corruption and dishonesty, differences in organizational cultures, inadequate regulations of the Nigerian third-party logistics industry, a high rate of traffic accidents, congested roads networks and ports and security issues such as robbery and smuggling are among the challenges and barriers to further logistics outsourcing in Nigeria. The findings from the content analysis also indicated that socio-economic and infrastructural limitations which pose risks that are outside the control of

organizations influence levels of logistics outsourcing. Data was requested from fifty-one large and small to medium Nigerian companies and third-party logistics firms. Six companies across a range of sectors responded representing a mix of large and small to medium companies and one third-party logistics company. Quantitative and qualitative data was collected. Quantitative data was analysed using descriptive statistics and statistical t-tests. The results indicate that the most outsourced logistics activities in Nigeria are last mile delivery, warehouse storage and transportation along with distribution management. Hence, potential for growth exists in logistics activities such as inventory management, order management, packaging, customer service, IT, material handling/management and inbound logistics. Qualitative data was analysed using thematic analysis of structured interviews. The findings indicate that companies keep logistics in-house mainly to control it and mitigate the risks associated, and because they can perform such activity in-house more competently and efficiently. A correlation analysis was done using secondary data sources and the findings indicate that developing countries such as Nigeria with less efficient logistics operations tend to outsource less logistics activities. A decision support framework was then developed based on the literature review and the findings drawn from the content analysis and primary data collection phase. The framework is tailored to Nigerian companies and employs a cost-benefit analysis and a scoring system that aims to assess the potential rewards of outsourcing a particular logistics activity against the potential risks. The weights and scores allocated on each logistics activity reflect the results of the content analysis and statistical t-test results. The decision support framework was tested with one of the research participant company and results further supports findings from literature review and content analysis that logistics activities such as last mile delivery prone to risks outside an organization's control tend to be outsourced more. The research recommends that third party logistics companies in Nigeria should focus more on working with clients as partners hence adopting a strategic alliance type of relationship with them. This will enable them to offer more integrated logistics functions, share risks, share, and transfer skills with their clients and

possibly achieve growth, efficiency, and competitive advantage for both parties. The research was limited by the notoriously challenging nature of conducting primary research of Nigerian companies.

Key words: Logistics outsourcing, 3rd party logistics, barriers, decision support framework, Nigeria, developing countries.

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Author's Declaration

I declare that this thesis and the work presented in it are my own and have been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University.

2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated.

3. Where I have consulted the published work of others, this is always clearly attributed.

4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work.

5. Where elements of this work have been published or submitted for publication prior to submission, this is identified, and references given at the end of the thesis.

6. This thesis has been prepared in accordance with the Staffordshire University and Buckinghamshire New University regulations.

7. I confirm that if the submission is based upon work that has been sponsored or supported by an agency or organization that I have fulfilled any right of review or other obligations required by such a contract or agreement.

Obinna Okeke

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1.0 CHAPTER ONE

1.1 Introduction

This research is an investigation into the practice of third-party logistics in Nigeria assessing the potentialities of the third-party logistics market in Nigeria and developing a Nigerian specific third-party logistics decision support tool. The research explores the current state of the third-party logistics (also referred to as 3PL in this thesis) practice in Nigeria with the aim to find out the potentialities of the market and to develop a Nigerian specific third-party logistics decision support tool. The research will provide explanations for reasons why developed country 3PL markets are more advanced in comparison to the Nigerian 3PL market by investigating the levels of logistics outsourcing usage in both developed and developing countries contexts through literature review and content analysis. After providing explanation for the differences in the levels of logistics outsourcing between developed countries, and developing country contexts with more focus on Nigeria, the study will further assess the potentialities of the Nigerian 3PL market through primary data collection and analysis. After that is achieved, the study will develop a Nigerian specific third-party logistics decision support framework/tool for Nigerian companies drawing from the analysis of data collected from experts and the findings of the research. The underlying concept of the decision support framework/tool will be based on the cost/benefit analysis concept and will be presented in the form of a structured questionnaire.

1.1.1 Logistics and supply chain management

“Logistics management is that part of Supply Chain Management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer requirements” (Council of supply chain management professionals, 2023, p.1). The foregoing definition of logistics by council of logistics management includes sourcing (point of

origin), inbound logistics (which deals with supply of materials to warehouses and factories), manufacturing, storage, outbound logistics (moving out materials or finished products from a warehouse/fulfilment Centre or from a factory) distribution, delivery, customer satisfaction, and reverse logistics (process of returning and recycling goods and products from customers back to the manufacturers).

Supply chain refers to the chain of companies, business and organizations that are collaboratively involved in the transformation of raw materials into finished products and goods and all those involved in the storage, distribution and delivery of these products and goods until it gets to the final consumer (Juttner, 2005; Felea & Albastroiu, 2012). Christopher (2022) describes the supply chain as the network of organizations that are linked in an upstream and downstream linkage carrying out the different activities and processes that produce value in the form of goods and services when they are in the hands of the final consumer (Bask and Juga, 2001; Little, 1999; Chow & Heaver, 1999; Ayers, 2001; Mentzer et al., 2001; Janvier-James, 2012). Supply chain management then is the management of the foregoing chain, the planning, controlling, coordination of information and implementation of all required activities to ensure the efficient forward and reverse material flow from its original state to finished goods and the storage and distribution of these goods among supply chain players (wholesalers, manufacturers, suppliers, distributors, retailers and third party logistics companies) till they get to the final consumer in the right quantity, in the right time, in the right place and in the right condition (Moberg et al., 2004, Mentzer et al., 2004; Opata, 2015; Ganesh & Nambirajan, 2013).

1.1.2 Background

According to Fatma & Mahjoub (2013) third party logistics was recognized in academic literatures as an industry in the 1980s (Yang, 2014). The concept of third-party logistics refers to the outsourcing of all or some logistics activities to a logistics providing company or a 3PL

company (Kavcic et al., 2016; Vasiliauskas & Jakubauskas, 2007; Solakivi et al. 2011 & Ying and Li-Jun 2012). The practice of third-party logistics emerged as a strategic business concept which is based on outsourcing (Yu & Lindsay 2011, Green et al 2008). According to Abdul-Halim et al (2012) outsourcing has emerged as one of the most popular management strategies that companies use as an efficient way of achieving competitive advantage because it allows them to concentrate on their core competencies. Green et al (2008) argued that companies outsource some or all their logistics to concentrate on their core competencies and to achieve operational efficiency in their supply chain. Several authors agree that logistics outsourcing is aimed at achieving efficiency in logistics, reducing cost of logistics and enabling companies to concentrate on their core business thereby increasing overall organizational efficiency and productivity (Hsiao et al 2010; Marchet et al 2018; Adebambo et al 2015; Yu & Lindsay 2011 & Ying and Li-Jun 2012). Though the foregoing may be true, some authors (though few) have argued based on their research that logistics outsourcing does not necessarily improve firms' business performance (Cho et al 2008; Solakivi et al 2011 & Tsai et al 2012).

Relevance of a third-party logistics research is evident as Mordor Intelligence (2023) projects that the global 3PL market is estimated to reach $1.22 trillion by year end of 2023 and $1.59 trillion by 2028 with an expected compound annual growth rate (CAGR) of 5.48% for the projected period of 2019-2028 showing considerable growth prospects (despite the corona virus pandemic) and significant relevance in the global economy that was projected to shrink by 4.9% at the end of 2020 though economic growth projections for 2021 was 6.0% (IMF, 2023). The increasing outsourcing of transportation and logistics services is driven by growing e-commerce penetration (Modor Intelligence 2020). Therefore, while 3PL helps companies achieve efficiency in logistics, reduce costs and increase overall organizational productivity by enabling them to concentrate on their core business, it is also relevant in today's growing e-commerce world which is dominated by social media and the world wide web.

Preliminary study shows that third party logistics is well practiced in the developed countries of the world like the UK, USA, and Europe compared to a lower practice in developing and emerging economies such as Nigeria (Dapiran et al., 2006; Sink et al., 1996; Solakivi et al., 2011; Lieb et al., 1993; Arroyo et al., 2006; Tian, 2010; Etokudoh et al., 2017; Onyebueke et al., 2019 and Adebambo et al., 2015). Also, preliminary study shows that there is a dearth of research on the use of third-party logistics in Nigeria hence the need for further research (Etokudoh et al., 2017; Onyebueke et al., 2019). Less academic literature is relatively found about third party logistics in Nigeria and similar developing countries compared to the literature available in the United Kingdom and other developed countries (Etokudoh et al, 2017). However, logistics outsourcing is not entirely absent in Nigeria there is evidence of logistics outsourcing in several sectors in Nigeria such as the Oil & Gas sector (Etokudoh et al. 2017 & Macharia et al 2017). Furthermore, evidence shows that third party logistics practice exists in Nigeria and continues to evolve as it generated a revenue of $4.6 billion and $5.2 billion in 2018 and 2019 respectively (Statista, 2020; Armstrong & Associates, 2020). The 3PL revenue of $5.2 billion in 2019 represents a 7.2% of the entire logistics costs in Nigeria which was valued at $71.9 billion (Armstrong & Associates, 2020). The $71.9 billion represents 16.1% of Nigeria's GDP in 2019 while the 3PL revenue of $5.2 billion represents 1.15% of Nigeria's GDP in 2019 showing significant contribution to the Nigerian GDP (Armstrong & Associates, 2020). Furthermore, the Nigerian 3PL revenue in 2019 is the highest (in absolute figures) among all African countries which generated a total of $28 billion in 3PL revenues in 2019 (Armstrong & Associates, 2020). However, the data also showed that 3PL revenue in Nigeria is the lowest in percentage of logistics costs among five African countries studied (Armstrong and Associates, 2020). Also, literature acknowledges that the Nigerian 3PL market is still under matured or underdeveloped (howbeit with growth prospects) compared to the developed regions of the world (Mordor Intelligence, 2020; Etokudoh et al., 2017). Furthermore, the Nigerian 3PL market size is estimated to be valued at $6.68 billion in 2023 which indicates growth (Mordor

Intelligence, 2023). Hence, the need for further investigation into the practice of third-party logistics in Nigeria to understand why it is less matured (though with growth prospects) compared to developed markets . Also, to provide explanations for the differences in the levels of logistics outsourcing between developing countries such as Nigeria and developed countries. The explanations for the differences will provide insights into the potentialities of the Nigerian third-party logistics market by identifying the reasons for which the 3PL market in Nigeria is less matured from which any potentialities and/or opportunities for growth can be identified. In addition to the foregoing, information and understanding on reasons why the 3PL market in developed countries is more advanced may be useful for assessing potential areas for growth in the Nigerian 3PL market.

In addition to the foregoing and as stated earlier that not much academic literature is found on logistics outsourcing in Nigeria as most literature on the subject have tend to focus on the practice in one sector. A cross-sectoral investigation into the practice of logistics outsourcing in Nigeria will be useful in developing a third-party logistics decision support framework/tool. Also, a study of the various logistics outsourcing activities across sectors will also provide insights to the development of the third-party logistics decision support framework/tool market in Nigeria by showing which logistics activities might be more risky to outsource and which might be more strategic to outsource.

1.2 Aim and Objectives

AIM: to investigate the use of third-party logistics outsourcing in Nigerian with the aim of developing a decision support framework that may serve as a tool where applicable for supporting organisations in Nigeria to make informed third-party logistics pre-selection outsourcing decisions. The framework is not aimed at assisting with supplier selection – only in

helping firms to decide if further outsourcing would be strategic for them or not. The foregoing aim will be achieved through the following objectives:

1. To examine the barriers and challenges to the practice of third-party logistics in Nigeria in order to provide a better understanding of the situation in Nigeria.
2. To investigate the motivation and aims for outsourcing in Nigeria providing explanations for lower levels of logistics outsourcing in Nigeria compared to developed countries. .
3. To investigate the levels of outsourcing of the various logistics activities across sectors in Nigeria
4. To develop based on the findings of the research, a decision support framework/tool, which may be used where applicable as a tool for making third-party logistics outsourcing pre-selection decisions.

1.3 Research Questions

To achieve the foregoing aim and objectives, the study will aim to answer the following research questions targeting each research objective:

Objective one:

I. What are the key barriers and challenges experienced by third-party logistics providers in Nigeria?
II. Are there cultural, socio-economic, or infrastructural factors that contribute to the barriers and challenges of logistics outsourcing in Nigeria?
III. What practices can be drawn from the developed 3PL markets to help in dealing with the barriers and challenges in the Nigerian third-party logistics industry?

Objective two:

I. What are the motivating factors for logistics outsourcing activities among companies in Nigeria?
II. What are the key factors that contribute to the lower levels of logistics outsourcing in Nigeria compared to developed countries?
III. How do cultural, socio-economic, and infrastructural factors influence the decision to outsource logistics activities across sectors in Nigeria?

Objective three:

I. Which specific logistics activities are most outsourced in Nigeria across sectors?
II. What factors are responsible for the decision to outsource specific logistics activities than others in different sectors in Nigeria?

Objective four:

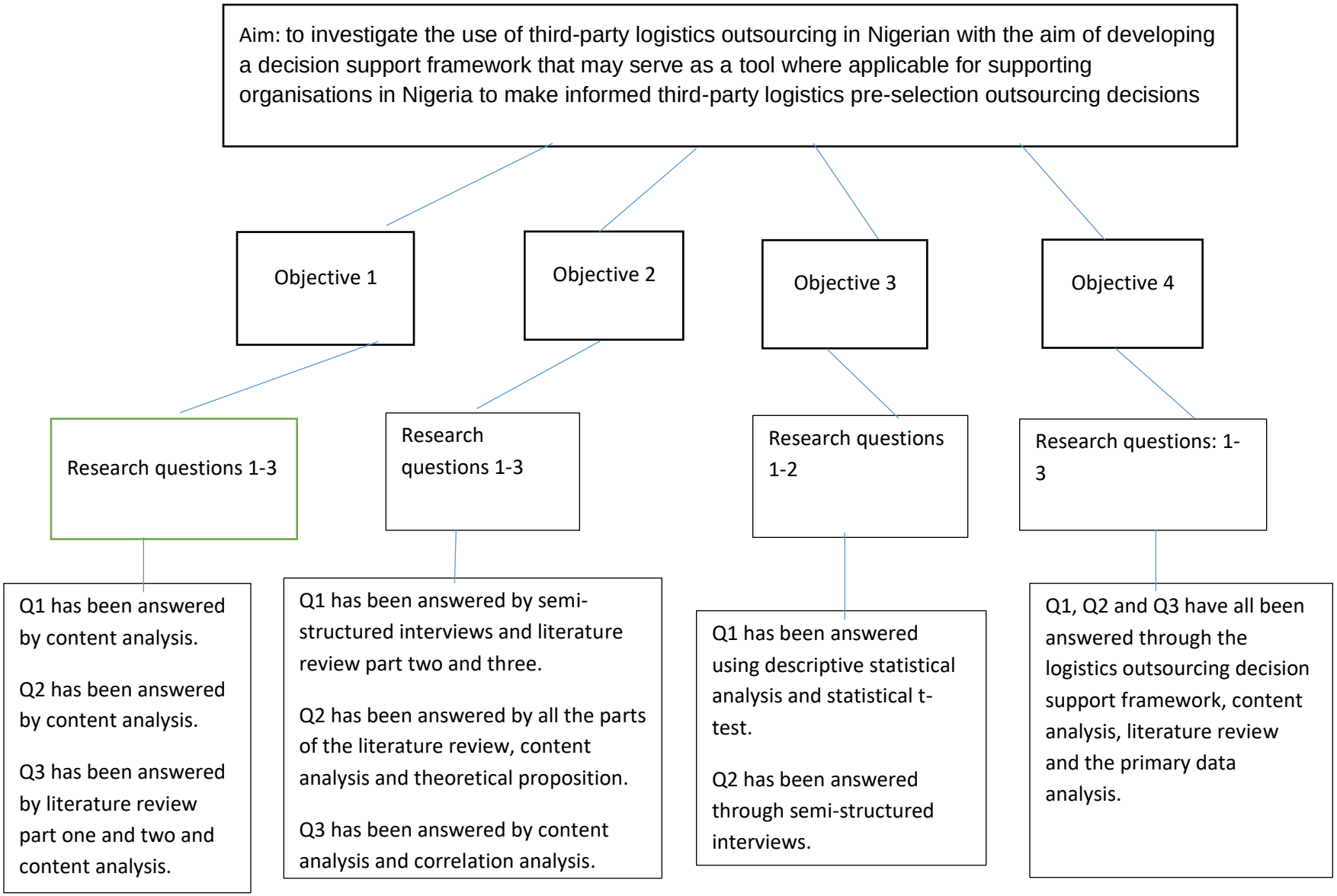
I. What are the key factors that should be considered when considering making logistics outsourcing decisions in the Nigerian context?
II. How can the logistics outsourcing decision support framework effectively guide companies in evaluating the potential benefits and risks of logistics outsourcing in Nigeria?
III. What are the specific criteria, parameters and metrics that should be incorporated into the decision support framework to indicate to companies about whether they should undertake more outsourcing activity or not?

All the research questions are informed by preliminary review of the literature on the topic.

1.4 Research Framework

The research framework shows the link between the research aim, objectives, research questions and methods by which each research question was answered hence meeting all the objectives. This is laid out in figure 1.1 below in a hierarchical manner:

FIGURE 1.1: RESEARCH FRAMEWORK


Aim: to investigate the use of third-party logistics outsourcing in Nigerian with the aim of developing a decision support framework that may serve as a tool where applicable for supporting organisations in Nigeria to make informed third-party logistics pre-selection outsourcing decisions
Objective 1
Objective 2
Objective 3
Objective 4
Research questions 1-3
Research questions 1-3
Research questions 1-2
Research questions: 1-3
Q1 has been answered by content analysis.
Q2 has been answered by content analysis.
Q3 has been answered by literature review part one and two and content analysis.
Q1 has been answered by semi-structured interviews and literature review part two and three.
Q2 has been answered by all the parts of the literature review, content analysis and theoretical proposition.
Q3 has been answered by content analysis and correlation analysis.
Q1 has been answered using descriptive statistical analysis and statistical t-test.
Q2 has been answered through semi-structured interviews.
Q1, Q2 and Q3 have all been answered through the logistics outsourcing decision support framework, content analysis, literature review and the primary data analysis.

1.5 Research Rationale and Expected Outcome

Firstly, the researcher's interest to carry out the research was motivated by the low level of research and academic literature on third party logistics in Nigeria and therefore seeks to further explore this under-researched area.

Second, this exploratory research will provide a basis for further research on the subject in Nigeria such as explanatory or predictive research to build on this research.

Third, the research will develop a logistics outsourcing decision support framework that can be useful where applicable for organizations contemplating the use of third-party logistics companies. The foregoing will help organizations make educated pre-provider selection decisions towards third-party logistics outsourcing in Nigeria. The decision support framework will be developed based on the results and findings of this research. This is novel as most third-party decision-making frameworks have focused on third-party logistics provider selection criteria while the decision support framework focuses on helping organizations make informed decision as to whether is strategic or efficient to outsource logistics or not and which logistics activity is strategic to outsource

1.6 Contribution to knowledge

While there is academic literature that have argued that logistics outsourcing is less practiced in developing countries than it is practiced in the developed countries such as the UK, USA, and Europe they have not been much literature that provides an explanation for the difference in levels of logistics outsourcing practice between developing and developed country contexts. . This research contributes to knowledge and academic literature by providing a tentative explanation for the reasons why third-party logistics outsourcing is less practiced in developing countries compared to developed countries and hence contributes to knowledge.

Also, the research entails an original research where primary and secondary data is collected and analysed about third-party logistics market in Nigeria which contribute to academic literature on the Nigerian third-party logistics market by providing insights to the challenges and barriers associated with logistics outsourcing in Nigeria and by providing insights to the potentialities of the Nigerian 3PL industry and market which will be useful to the current and potential Nigerian third party logistics industry players and experts, market participants, potential investors and the academia.

Also, while previous studies on third-party logistics in Nigeria tend to focus only on one sector, this research involves a multisectoral investigation of third-party logistics practice in Nigeria (Etokudoh et al., 2017). Olubiyo (2022) is an example of such studies which focused only on one sector. Olubiyo (2022) focused on the impact of third-party logistics outsourcing on the performance of clothing manufacturing SMEs in Nigeria.

Also, the development of a third-party logistics pre-selection decision support tool will contribute new knowledge to the body of knowledge as previous scholars have focused on third-party logistics decision support framework for selection of a suitable 3PL provider while this research focuses on developing a 3PL pre-selection decision support framework. That is, a decision support framework that helps companies to first evaluate the viability of engaging in a logistics outsourcing arrangement before considering making a selection for the most suitable 3PL firm to contract. An example is Ejem et al. (2021) which carried out a research on evaluating and selecting Nigerian third-party logistics providers using multi-criteria decision models but the research does not provide a model which companies in Nigeria can use for assessing the viability or profitability of engaging in third-party logistics before selecting 3PL providers.

1.7 Chapter two: literature review

The literature review first reviews topic areas that are broad but directly related to the research topic area. They include literature on logistics and supply chain management concepts, theories, and metrics. Also, third party logistics definitions, concepts, theories of outsourcing, problems with logistics outsourcing, types of third-party logistics contractual relationships and relationship management, correlation between third party logistics and firm performance, the role of third-party logistics in supply chain, third party logistics selection criteria and decision-making frameworks and third-party logistics practices in advanced/developed regions of the world. A review of these broad subject areas is required to provide and demonstrate extensive knowledge in the subject areas of logistics and supply chain management and third-party logistics. It also shows gaps in the literature on third party logistics that will require further research. The review also establishes the foundation and meaning of certain concepts and theories that will be applied in the analysis, findings/discussion, and conclusion/recommendation stages. Examples of such concepts are supply chain/third-party decision-making techniques such as Fuzzy Analytical hierarchy process (FAHP) and Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS). Other examples include theories of outsourcing such as Transaction Cost Economics (TCE), logistics strategies such as Just-In-Time (JIT) and lean, contractual relationships in third party logistics.

The literature review is then narrowed down and deals with the challenges, barriers and problems with logistics outsourcing in developing countries, literature of logistics outsourcing practice in developing countries, and literature that compare logistics outsourcing between developed and developing countries of the world. This is aimed at providing background information and insights into aspects of the research that are more closely related to the aim and objectives of the research. The literature review further highlights the risks that may be associated with low levels of logistics outsourcing in Nigeria and similar developing

countries. It also highlights papers that recommend for further study into 3PL in Nigeria and other developing countries. The literature review further highlights the possible risks and/or opportunity cost that may be associated with the practice of logistics outsourcing in Nigeria without a reliable decision support framework/tool. The foregoing are required to highlight the gaps and purpose of the thesis.

1.8 Chapter three: background industry analysis

This chapter investigates and analyses the Nigerian third-party logistics industry while providing examples of major industry players. The market trends, growth projections, market segmentation and major players are discussed. This was done as a background industry analysis to the content analysis, correlation analysis and the primary data analysis

1.9 Chapter four: methodology

The methodology chapter consists of an explanation and justification of the methods that were applied in carrying out the research. The research paradigm and its philosophical assumptions with which the researcher is identified is first explained and justified as a background to the research methodology. The justification for identifying with the chosen paradigm (pragmatism) is made by comparing it with other alternative paradigms such as positivism and interpretivism and explaining why pragmatism is more applicable and best suited to the research. The foregoing approach is also used in providing explanations and justification for choosing a particular type of research purpose (exploratory research purpose), for choosing a particular type of research reasoning (abductive reasoning), and for choosing the methods applied within the process of carrying out the research. The latter include providing explanation and justification for the research design, which is a mixed method research, explaining why the research is a case study, the units of analysis of the research, and explaining why the research is cross-sectional research instead of longitudinal

research. It further includes explanation and justifications for the chosen data sampling methods (purposive, convenience and snowballing sampling) and methods of primary data collection as well as a lay out of the ethics considerations. The methods of primary data collection are a mixed method which includes both quantitative and qualitative data collection. The qualitative data was collected using semi-structured interviews, while quantitative data was collected using structured interviews and Likert scale questionnaires. The research also includes secondary data which were collected through the content analysis, World Bank database, and Armstrong and Associates. These are all explained in detail and justified in the methodology chapter. The methods of data (both primary and secondary data) analysis or the data (both primary and secondary data) analysis techniques such as content analysis, descriptive statistics, statistical t-test, correlation analysis and thematic analysis of semi-structured interviews are all explained and justified in the methodology chapter. Furthermore, an explanation of how the research is evaluated is also made to ensure validity and reliability of the research.

Also, a brief explanation of the main research output which is the decision support framework and the justification of its purpose and process is provided in the methodology chapter. The framework followed a similar process from Jovcic et al. (2019) who used FAHP and TOPSIS methods. Fuzzy analytical hierarchy process (AHP) and Technique of order preference similarity to the ideal solution (TOPSIS) have been commonly used by scholars to develop third-party logistics company selection criteria and decision-making framework (Jovcic et al. 2019). These two techniques are used as a model for example in the methodology chapter upon which a Nigerian logistics outsourcing decision support framework is developed. The ingredient of the framework is however different from previous frameworks as the purpose of the framework is different. While the framework aims to support organizations in making logistics outsourcing decisions, most previous frameworks have focused on supporting organizations in choosing and selecting a suitable third-party logistics firm, hence the difference.

The research output is the last part of the major areas of research as outlined in Collis and Hussey (2021). These major areas of research according to Collis and Hussey (2021) include the research purpose, research reasoning, research process and research output. These major areas of research are explained in detail in the methodology chapter.

The research employs abductive reasoning. The research methodology provides a detailed justification of why abductive reasoning is chosen instead of deductive and inducive reasoning linking the justification to the research aim and objectives which is also the basis upon which the research purpose is based.

Then the research process which includes the research design is explained. The focus of the research on Nigeria makes it a case study design. According to Gorman and Macintosh (2014) a case study is usually an in-depth investigation of a contemporary phenomenon within a real-life context. This definition by Gorman and Macintosh (2014) notes that a case study is an investigation of a research area of interest done within a real-life context. The methodology chapter explains how the foregoing description of case study applies to this research linking the exploratory nature of the research. Furthermore, the units of analysis of this case study are explained as Gorman and Macintosh (2014) noted that a case study is essentially required to define its unit of analysis which refers to the case that is being investigated.

The methodology chapter then explains why the research is cross-sectional research and differentiates this from a typical social survey. Also, justification for employing a cross-sectional research design instead of a longitudinal research design is provided along with the characteristics of a cross-sectional research design.

As noted earlier, the research data collection includes both secondary and primary data collection methods. Secondary data was first collected for content analysis through websites, databases, academic journal articles and special reports. These were all used in the content

analysis for data collection both for thematic analysis within the content analysis and for further use in the decision support framework and theory development.

Also, secondary data was collected from the World Bank database and from Armstrong and Associates to represent variables in the correlation analysis. The data from the World Bank and Armstrong and Associates were explained briefly in the methodology chapter and in detail in the analysis chapter. Justification for using these data was also provided in the analysis chapter. The variables were also defined and classified and justification of the same provided in the analysis chapter.

1.10 Chapter five: analysis, results, and discussion

First secondary data collected were analysed in the content analysis using thematic analysis. Secondary data was also analysed using correlation analysis. Then primary data collected from sample companies in Nigeria were analysed using quantitative techniques such as descriptive statistics and statistical t-test. Primary data was also analysed using qualitative thematic analysis of semi-structured interviews. The research framework hierarchical diagram in section 1.4 above specifies how each of the data analysis techniques were used to provide answers to each of the research questions and objectives.

Primary data collected from the Nigerian samples are limited as they do not contain company quantitative data records but expert opinions. Therefore, based on the data collected, a descriptive statistical analysis of the data was used.

Though the research is not confirmatory research, a descriptive statistical analysis only describes and illustrates any differences in the data set. Therefore, these differences may not be statistically significant and whether they are statistically significant or not remains unknown except when they are tested. A statistical t-test was therefore performed to determine if the differences in the data are statistically significant.

Correlation analysis is a quantitative method used to evaluate if a relationship exists between two variables and the strength and direction of the relationship. Hence, correlation analysis was used to test some assumptions that were observed from secondary data obtained from Armstrong and Associates on the global third-party logistics market. These assumptions were tested using correlation analysis and the findings from the results of the tests were used to propose a theory that explains why logistics is more outsourced in developed countries than developing countries such as Nigeria. Further justification for the correlation analysis is made both in the methodology and analysis chapter. A full analysis of the correlation tests, the results, interpretation of results and theoretical proposition is made in the analysis chapter.

After the correlation analysis, thematic analysis was employed to analyse the data obtained from the semi-structured interviews. Information was recorded during the interview by notes made by the researcher. Recordings were not done electronically as there was no consent from the participants for electronic recording. The notes were analysed thematically by developing themes.

Then a discussion section involving a discussion of the results of the primary data analysis with the findings of the literature review was done. After this, a tentative theory was developed and proposed. Also, the potentialities of the Nigerian third-party logistics market were assessed based on the research findings.

A Nigerian third-party logistics decision support framework was then developed based on the findings of the literature review, content analysis, and quantitative primary data analysis.

1.11 Chapter six: conclusions, recommendations, and research output

Chapter five summarized the key findings of the research and recommendations that were made from the findings. Then these findings were linked to the research questions showing

which questions were answered by each finding. Furthermore, the answered questions were then linked to the research objectives showing which objectives were met by the findings. The key outputs of the research are the Nigerian third-party decision support framework and the theoretical proposition both informed from the findings of the research.

The theoretical proposition provides a tentative explanation for the difference in the levels of logistics outsourcing between developing countries such as Nigeria and developed countries. The inputs to the development of the theory are drawn from various methods employed to collect and analyse data. A full explanation of the theory is provided in analysis and discussion chapter and summarized in chapter five as part of the research output.

The research overall contribution to knowledge and practice is then laid out in the chapter and these are based on the research findings, the theoretical proposition, and the decision support framework. Also, an identification of any further research required because of the research outcomes or output is made in chapter five including potential further studies that can be built upon this research.

2.0 CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

First, the literature review focused on topics, concepts and definitions around logistics and third-party logistics. The review is done in themes. It reviews literature published globally with a section on third-party logistics practice in the developed regions of the world.

The review of literature then went on further to focus on logistics outsourcing practices in developing countries similar to Nigeria. It reviewed literature that deals with the challenges, barriers and problems with logistics outsourcing in developing countries, literature of logistics outsourcing practice in developing countries, and literature that compare logistics outsourcing between developed and developing countries of the world. This provided background information and insights into the nature of third-party logistics practice in developing country contexts similar to Nigeria.

The literature review then further highlights the risks that may be associated with low levels of logistics outsourcing in Nigeria and similar developing countries. It also highlights papers that recommend for further study into 3PL in Nigeria and other developing countries. It further highlights the possible risks and/or opportunity cost that may be associated with the practice of logistics outsourcing in Nigeria without a reliable decision support framework/tool. Literature that acknowledged the dearth of third-party logistics research on developing countries compared to developed countries*. Literature on third-party logistics in Nigeria that focused on one sector were identified showing the dearth of a multi-sectoral third-party logistics research in Nigeria. Literature that generally acknowledged dearth of research on third-party logistics in Nigeria were also identified.

2.2 Concepts of logistics and supply chain management

The concept of logistics has been described and defined from different perspectives such that there is no one universal definition of logistics (Coyle et al., 2021). Rushton et al. (2000) describes logistics as the combination of material supply management and distribution of finished products to the end user or consumer. Rushton et al. (2000) further notes that material supply management process involves the flow of raw materials into and through the production process while distribution involves the flow from finished products to the end user. However, Marchesini & Alcantara (2016) notes that logistics is rather a part of the supply chain management process (Mentzer et al., 2004). They argue that logistics is not only a functional part of the supply chain management process but also a part of its business process hence that logistics directly impacts the efficiency and effectiveness of the supply chain management process (Marchesini & Alcantara, 2016). Furthermore, Marchesini & Alcantara (2016) argues that logistics practices are constantly changing in line with improvements in supply chain structure and strategy (Bowersox et al., 2013). The foregoing therefore suggests that logistics is a functional part of the supply chain management process and a part of its business process rather than supply chain management being a constituent part of logistics as suggested by Rushton et' al (2000). Furthermore, Thoo et al. (2017) however notes that logistics and transportation are among the fields that have contributed to the proliferation of supply chain management literature. Thoo et al. (2017) view logistics management as a separate field but also a part of supply chain management and one of the three categories of supply chain management (Li, 2002). Other categories are purchasing and supply management, and integrated supply chain management (Li, 2002 & Thoo et al., 2017).

Some authors did not differentiate logistics from supply chain management as Frazelle, (2002) gave one definition for both logistics and supply chain management. Frazelle, (2002) defined logistics and supply chain management as the flow of materials, money, resources,

and information to and from suppliers and consumers. This foregoing definition explains the distribution part of logistics and supply chain management but does not include the production part which considers the process of transforming raw materials into finished products. In a similar vein another author Basu (2007) sees logistics as part of the supply chain management process and not different from supply chain management. Simchi-Levi et al (2003) in Basu (2007) defined supply chain management as a set of methods that are utilized to efficiently integrate supply chain members, warehouses, stores, so that value is produced at the right quantity, at the right place, at the right time with minimal cost while satisfying customs service requirements (Opata, 2015 & Ganesh & Nambirajan, 2013). The foregoing definition of supply chain management does include the production process, the need for efficiency and minimizing cost and the need to satisfy customer. Erturgut, (2012) gave a similar definition to Basu, (2007) as he argues that supply chain management involves the activities from raw material till the product gets to the final consumer, that is all the research involved, supply, production, tabulation, order management, inventory management, warehousing, and customer service (Erturgut, 2008 & Lomnus & Vokurka, 1999; Richey and Davis-Sramek, 2020). However, cooper et al. (1997) has a different view to it as they argued that supply chain management is more than an extension of logistics and that supply chain management is not just the same thing as logistics as some scholars and practitioners have asserted but that based on literature and management practice that there are certain coordination of activities and processes within and between organizations in the supply chain that extends beyond logistics and that this is what they believe to be supply chain management. However, Hou et al. (2015) notes that the concept of supply chain management has evolved from physical distribution to logistics and then to supply chain management and is now based on the material flow theory (Xu 2008, Howleg & Rich 2004, Klug 2013, Kaipia 2009, Altekar 2012, Raghuram & Rangaraj 2000). The foregoing view of Hou et al. (2015) indicates that supply chain management evolved from physical distribution to logistics and then to supply chain management which also suggests that supply chain management is not different or separate from logistics but a modified or extended form of

logistics which is contrary to Rushton et al. (2000) view that refers physical distribution to be a second part of what makes up logistics. The view of Hou et' al (2015) is also contrary to the view of cooper et' al (1997) who argues that there is coordination of activities and business processes within and among organizations in the supply chain that extends further than logistics. Hence there seems to be no consensus among scholars based on review of literature about the definition of logistics and supply chain management and whether they are one and the same concept or different (Coyle et al., 2021). However, according to Mentzer et al. (2004) the definition of logistics and supply chain management below given by the Council of Supply Chain Management Professionals (CSCMP) is more widely accepted:

"Logistics management is that part of Supply Chain Management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption to meet customer requirements (Council of Supply Chain Management Professionals, 2023, p.1). This research adopts the foregoing definition of logistics by council of supply chain management professionals because it is more comprehensive as it includes sourcing (point of origin), inbound logistics, manufacturing, storage, outbound logistics, distribution, delivery, customer satisfaction, and reverse logistics (Coyle et al., 2021). Definition of supply chain management by the Council of Supply Chain Management Professionals (CSCMP) is thus: "supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies" (Council of Supply Chain Management Professionals, 2023, p.1). The foregoing definition of supply management by the Council of supply chain management professionals is a comprehensive definition of supply chain management as it includes all logistics management activities and coordination and collaboration of all supply chain partners

(Richey and Davis-Sramek, 2020). Figure 2 below describes the components of logistics management which includes logistics activities, logistics management and the scope of logistics management within a supply chain.

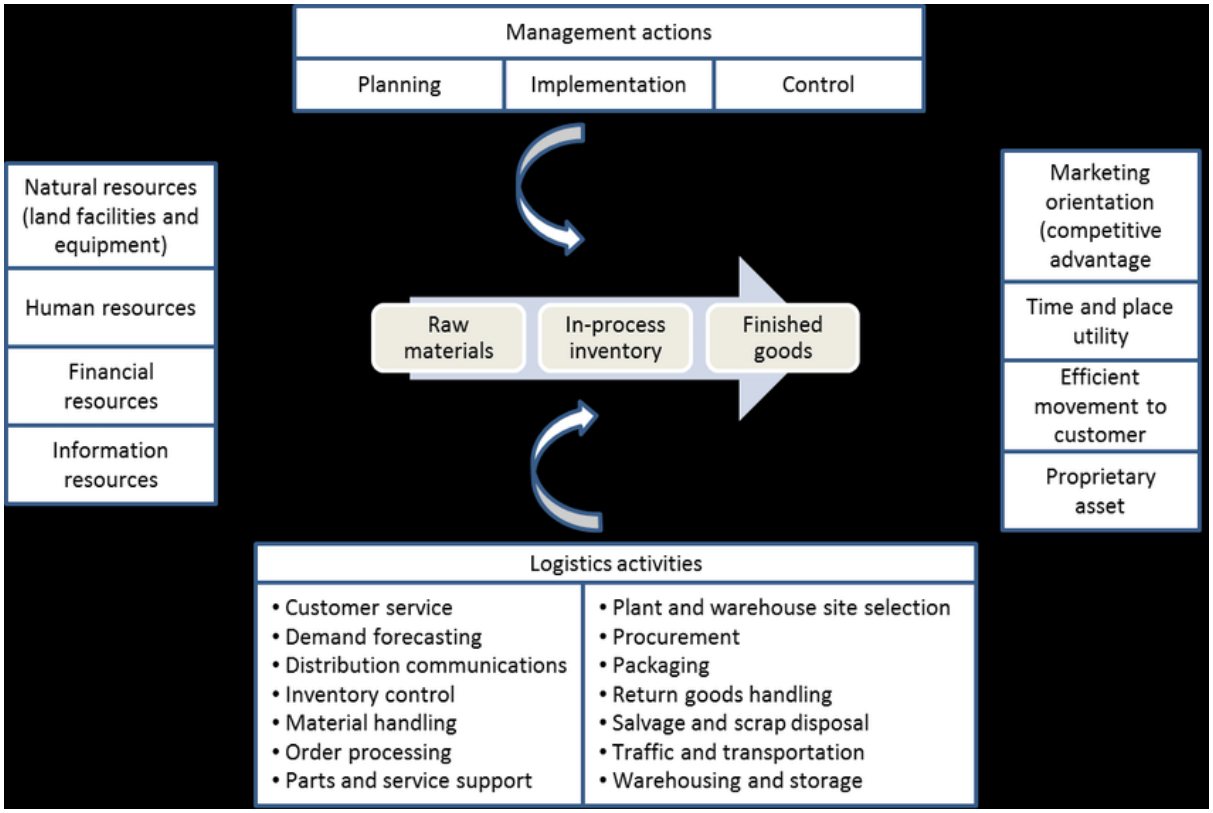


figure 2.1: Components of logistics management, adapted from lambert et al. (1998)

The definition of the Council of Supply Chain Management Professionals (CSCMP) above suggests that logistics is a constituent part of supply chain management, and that supply chain management is broader than logistics management (Mentzer et al., 2004). However also, Bowersox et al. (2012) made some differentiation between logistics and supply chain management. They argued that while supply chain management is a system that links major business processes within and among the supply chain members (manufacturing companies, suppliers, retailers, wholesalers) into a high-performance business model with the aim of achieving competitive advantage, logistics on the other hand refers to the flow and

storage of goods, services, and information both within and outside an organization (Felea & Albastroiu, 2013). This research also adopts the description of the concept of logistics and supply chain management by Bowersox et al. (2012) because it clearly describes supply chain management, putting it in the right perspective and makes a differentiation between supply chain management and logistics putting both in the right perspective. Secondly, Bowersox et al. (2012) argued that the focus of managing a supply chain is to gain competitive advantage for its members while the goal of logistics is to meet and satisfy customer requirements (Gammelgaard & Larson). Furthermore, the definition of logistics management by the Council of Supply Chain Management Professionals which is adopted by this research is further justified because it agrees with scholars such as Bowersox et al. (2012) who argue that logistics management is a concept within and outside an organization and that logistics management is a constituent part of the supply chain as it is concerned with an organization within the supply chain (Felea & Albastroiu, 2013).

2.3 Logistics service providers: first party, second party, third party, fourth party and fifth party logistics

The first-party logistics refers to a person or company who needs to ship their goods locally or internationally to the final consumer and may do this using the service of other logistics service providers such as the second party or third party or may possess its own assets and capabilities to carry out all its logistics activities including transportation and storage in-house (Mathauer, and Hofmann, 2019). Mathauer and Hofmann (2019) further noted that second-party logistics providers are most times referred to as transport carriers that transport humans and goods by air, sea, and land. Examples are British airways and Cargolux. In some cases, they also provide storage such as warehouses for companies (Ricardo-Moreira, et al. 2023). They do not engage as middlemen contracted to manage a company's logistics activities, but they are regular standard logistics service providers providing transportation and or storage services for companies and individuals (Diem Le, et al., 2023).

Second party logistics companies own or lease assets for their operations such as fleets of cargo airplane carriers, fleet of coaches or cargo ships (Diem Le et al., 2023).

According to Papadopoulou (2001) third-party logistics providers are companies who are independent and provide one or more logistics services to a purchasing company. Third-party logistics do not own the product being distributed but they are bound legally and are responsible for efficiently carrying out the requested logistics activities of the purchasing company (Papadopoulou, 2001). The foregoing description by Papadopoulou, (2001) did not say much about the contractual side of third-party logistics. However, Papadoulou (2001) further notes that the relationship between the purchasing company and a third-party logistics provider is usually long-term and beneficial. Simchi-levi (2000) notes that third-party logistics is the use of an outside company to carry out some or all a firm's materials management and product distribution function. Simchi-levi (2000) focused on outsourcing of material management and product distribution which broadly includes inventory management, warehouse management and storage, and transportation but does not talk about other logistics functions such as customer service, information technology such as tracking, material handling and packaging.

However, Chen et al. (2010) notes that though there have been a surge and proliferation of publications in the topic of third-party logistics, the academic literature seems to be disjointed with over 70% of the academic literature being purely descriptive and 69% are lacking theoretical foundation (Selviaridis & Spring, 2007 & Skjoett-Larsen, 2000). Chen et al. (2010) further notes that though the foregoing is the situation of third-party logistics literature, however, great opportunity remains for expansion on the topic. Therefore, this research will further review literature on third party logistics from different perspectives and how third-party logistics affect supply chain management.

Murphy & Poist (1998) described third-party logistics from the perspective of a shipper as a long-term mutually beneficial relationship between a shipper and a third-party where the third

party provides more customized services than basic and the services most times covers a broad number of functions (did not include the fact that the function may be single). Vasiliauskas & Jakubauskas (2007) describes third party logistics more from a transportation perspective as the outsourcing of logistics and transport services to external companies explaining that third-party logistics companies are not consignors nor are they consignees. Maloni & Carter (2006) in Fatma & Mahjoub (2013) defined third-party logistics from a generic perspective and noted that in the early stages of the development of the concept of third party logistics, that it was largely defined as the use of an outside company to perform logistics functions which traditionally would have been performed within an organization (Adembambo et al., 2015 & Mathien & Chow, 2018). Lieb & Randall (1997) in Fatma & Mahjoub (2013) defined third-party logistics providers as companies that provide several logistics services for their customers. Rabinovich et al. (1999) in Fatma & Mahjoub (2013) described logistics outsourcing from a manufacturing perspective as a relationship between manufacturing firms and third-party logistics providers in a long- or short-term contracts or in an alliance. Mathien & Chow (2018) defined third-party logistics from a more generic but practical view noting that third party logistics is a functional, distinct, outsourcing relationships between organizations involving transportation, warehousing, inventory management, information services such as vehicle tracking and tracing, supply chain management, extra value services such as secondary assembly and installation of products (Berglund et al., 1999). This research adopts the definition of third-party logistics by Mathien & Chow (2018) because it specifies some of the logistics services that are provided by 3PLs, hence it is specific and more practical. Also, because it is comprehensive as it includes some extra value services provided by 3PLs, and it includes the core of third-party logistics which is outsourcing relationship between organizations and are usually based on contracts. Furthermore, Adembambo et al., (2015) defined third party from a contractor's perspective noting that third party logistics and contract logistics are the same (Lieb et al., 1993). Adembambo et al., (2015) however argued contrary to most views above that third-party logistics only starts their work when manufacturing has been completed. The foregoing view

of third-party logistics is different from others because it does not acknowledge that third party logistics companies are often also hired to provide logistics services before and within the manufacturing process and not necessarily only after the manufacturing process. Mathauer and Hofmann (2019) noted that third-party logistics companies provide all types of logistics services to clients and are asset based. However, some third-party logistics companies do not have assets such as most freight forwarders who are intermediaries or middlemen between shippers (consignors) and receiver (consignee). They are contracted by the consignor (usually the first party) to manage their shipping using the assets of second party logistics providers or carriers such as Emirates cargo to ship on behalf of the consignors Diem Le et al., (2023). They are experts in handlings processes involved in shipping such as preparation of documents, custom compliance, cargo insurance and storage of cargo near ports ready for shipping (Diem Le et al., 2023). Third-party Logistics involves outsourcing of some or all the entire logistics activities of a company to an external logistics service operator. Third-party logistics companies are often contracted as an intermediary between their client and its customers, organizing transport activities and storage facilities. Third-party logistics services also include order preparation and order management, packaging and material handling, cross-docking, inventory management and return logistics on behalf of client companies (Gupta et al., 2022).

Diem Le et al. (2023) noted that fourth party logistics (referred to as 4PL henceforth) was introduced and emerged from Accenture Consulting company. According to Diem Le et al. (2023), Accenture Consulting company defined 4PL as an integrator that assembles the resources and logistics capabilities of its organizations and other organizations to run a well designed and built supply chain solution. Authors and scholars have described 4PL as an orchestrator, coordinating the logistics activities of an entire supply chain (Diem Le et al., 2023; Ricardo-Moreira et al., 2023; Mathauer and Hofmann, 2019). Mathauer and Hofmann, (2019) argued that 4PL subcontract logistics services to other logistics service providers such as 3PL and 4PL while playing a coordinating role but do not own physical assets as

2PL and 3PL do. However, in some cases, asset based 3PLs such as Wincanton logistics also provides 4PL services to some of its clients (Global Data Plc, 2022). The expert services of 4PL include consulting, planning, management, or warehousing. A 4PL provider does not often conduct physical transport or warehouse activities, rather they outsource these to a 3PL service provider. A 4PL service provider therefore coordinates the entire supply chain of its clients and takes the initiative and lead in designing and optimizing the supply chain (Hingley et al., 2011). For example, a 4PL contracted by Starbucks coordinates activities between Starbucks and Starbucks' suppliers. In addition, the 4PL provider is responsible for engaging 3PL operators on behalf of Starbucks who will perform the physical logistics tasks (Harvey, 2000). In 4PL projects, the client depends more on the 4PL provider than it depends, for example, on the 3PL. Therefore, 4PL contracts are often long-term (Kao et al., 2019). Though the foregoing contradicts the study findings of Le et al. (2021) which asserts that 3PLs play the role of supply chain coordinators. Le et al. (2021) study findings are however limited to construction supply chains only. Kao et al. (2019) argued that because of the inadequacies of third-party logistics (3PL) to fully adapt to the rapid growth in global e-commerce, the supply chain model of 4PL seems to be replacing the former gradually. The foregoing however is still a debate among scholars and not yet a consensus (Gupta, et al., 2022; Mathauer and Hofmann, 2019; Diem Le et al., 2023; Ricardo-Moreira et al., 2023).

Vasiliauskas and Jakubauskas (2007) noted that the fifth-party logistics service provider being an emerging new concept is like the supply chain manager of an entire supply chain while the 4PL is the integrator, the 3PL is the logistics service provider and the 2PL is the forwarder. Hosie et al. (2007) noted that pressures from the global competitive environment are leading to speculation about the possibility of a potential '5PL' services. Economic imperatives, the benefits of technological innovation and managerial competence in providing advanced logistics services may succeed in environments capable of causing high levels of commercial and social trust between the companies and their partner Supply chain

management service providers to be endangered (Hosie et al., 2007). Hence, the 5PL advanced technological and managerial services may prevent the commercial and social trust between companies and their supply chain management service providers from being endangered or lost (Hosie et al., 2007). Hosie et al. (2012) noted in their systematic literature review that possible future fifth party logistics services are meta-analytically indicated in the literature with suggestions of future empirical research that are based on new insights. Fredriksson et al. (2021) noted that the concept of Fifth Party Logistics or 5PL is still an emerging logistics term. They further noted that a 5PL service provider combines the physical logistical services of a 3PL operator with the supply chain solutions of a 4PL operator. The 5PL service provider does this by taking a step further in managing an entire network of supply chains client in the ecommerce sector. Hence, their unique selling point is the use of the most advanced and disruptive technologies. Pfoser et al. (2022) noted that some scholars recommend a new type of logistics service provider which is the 5PL to assume the role of an orchestrator from the 4PL for coordination and optimizing the entire supply chain. However, Pfoser et al. (2022) noted that these scholars did not provide sufficient insight that backs their suggestion.

Third-party logistics (3PL) outsourcing

Third-party logistics as a logistics service provider has been explained and compared with other logistics service providers in section 2.3 above. All third-party logistics service providers, fourth-party logistics service providers and fifth-party logistics service providers are contractors to whom companies outsource their logistics activities to. As explained above, fourth-party logistics providers are supply chain orchestrators, while the fifth-party logistics provider is an emerging terminology in the literature, and they take a step further in managing an entire network of supply chains in the ecommerce sector and their unique selling point is based on the use of the most advanced and disruptive technologies (Pfoser et al. 2022; Fredriksson et al. 2021). The third-party logistics provider provides logistics services on-behalf of the client who may be a second party logistics provider (typically

transport providers) or a first-party logistics provider- typically shippers or companies in any sector who engage in any logistics activity (Gupta et al., 2022; Diem Le et al., 2023). Hence, third-party logistics (3PL) refers to contracting a third-party logistics or 3PL provider to manage the logistics activities of another organisation. This therefore refers to third-party logistics outsourcing or 3PL outsourcing which excludes outsourcing to other logistics service providers such as the fourth-party logistics (4PL) or fifth-party logistics (5PL) (Winqvist, 2023; Rocha and Lehenbauer, 2020; Shi et al., 2020; Jones and Rashid, 2020). In which case they are referred to as fourth-party logistics 4PL or fifth-party logistics 5PL outsourcing. This research focuses on investigating the practice of outsourcing to third-party logistics providers in Nigeria or the practice of third-party logistics in Nigeria. Most authors do not find any need to term outsourcing logistics to a third-party logistics provider as third-party logistics (3PL) outsourcing as the practice of outsourcing logistics to a third-party logistics or 3PL provider in itself is the ideology or meaning of the phrase 'third-party logistics' or '3PL' (Rocha and Lehenbauer, 2020; Wingvist, 2023; Fassetta, 2020). Also, in the same vein, most scholars refer to the practice of outsourcing supply chains to fourth-party logistics and fifth-party logistics providers as fourth-party logistics and fifth-party logistics and rarely do refer them as fourth-party logistics outsourcing or fifth-party logistics outsourcing as the practice of outsourcing supply chains to a fourth-party logistics provider or fifth-party logistics provider is the ideology or meaning of the phrase 'fourth-party logistics' and 'fifth-party logistics' respectively (Rocha and Lehenbauer, 2020; Winqvist, 2023; Akbari et al., 2020).

2.4 Third-party logistics and its role in supply chain performance

Bask (2001) argued that third party logistics providers are seen as a supportive member of the supply chain and lambert et al. (1998) in bask (2001) notes that supportive members of the supply chain are members who provide expertise, resource; knowledge, capabilities, and assets to other members of the supply chain (Adembambo et al., 2016; Mathien & chow, 2018). Bask (2001) argued that supply chain members can profit from the services of third-

party logistics firms in several ways such as helping them to concentrate on their core competencies and capabilities, helping them to work on improving overall performance, try entry into new markets, control costs, improve customer satisfaction, increase flexibility, increase investment, and find more cost-effective means of providing services etc. (Jothimani & Sarmah, 2013; Jayaram & tan, 2010; Hilletofth & hilmola, 2010; Liu & lee, 2018). Haffer (2018) argued that there has been more emphasis on the role of third-party logistics providers in managing the logistics process of a supply chain and in managing the customer and suppliers' relationship within the supply chain (Liu & lee, 2018). Furthermore, Haffer (2018) argues further that third party logistics providers develop their business performance measurement systems towards achieving their role in the supply chain and they also use the supply chain performance management systems to measure their performance in the supply chain which ultimately affects their overall performance as well as the performance of the supply chain (Jothimani & Sarmah, 2013; Zacharia et al., 2011). While Van der Westhuizen and Niemann (2022) noted that third-party logistics providers in South Africa play more transactional, relational, dependency, resilience and value-added roles such as core competency roles, complementary roles, and strategic partnership roles. Vlachos, I. and Polichronidou (2024) used resource-based view, social capital perspective, agency theory and transaction cost economics theory to investigate the role of third-party logistics providers in a supply chain triad and study found that 3PLs play the role of service developers, customer developers and customer adaptors.

2.5 Third-party Logistics and Supply chain Performance metrics

Beamon (1999) argues that cost (inventory and operations cost) and customer responsiveness (lead time, fill rate and stock out probability) have been two dominant measures that have been used in supply chain performance measurement models. Beamon (1999) further notes that in addition to cost and customer responsiveness, activity time (lead time) and flexibility have also been used separately and together. Beamon (1999) did not

adopt any previously used supply chain performance model but rather argued that the right use of resources, flexibility (how the supply chain reacts to uncertainty) and output have been identified as vital factors that determines the success of a supply chain. Hence, Beamon (1999) developed a mathematical supply chain performance measurement framework which is based on resource measures, output measures and flexibility measures. Furthermore, Gunasekaran et al. (2003) notes that previous literature has measured supply chain based on supply chain standard process and activities which are: plan, source; make or assemble and delivery/customer satisfaction. Furthermore, Gunasekaran et al. (2003) however argued that not much emphasis in literature have been placed on measuring supply chain operations from a strategic perspective hence Gunasekaran et al. (2003) developed a framework for supply chain performance measurements which measured the foregoing supply chain standard process/activities, but these were measured from a strategic, tactical, and operational perspective. Hence, Haffer (2018) argued that the performances of third-party logistics companies in a supply chain are sometimes measured based on their strategic effectiveness along with their tactical and operational efficiency . Gopal & Thakkar (2012) also argues that there are some issues that have been identified with previous works on supply chain management systems which include: lack of emphasis on strategy (Gunasekaran et al., 2003; 2004;) too much emphasis on cost to the detriment of indicators that are not cost related (Beamon, 1999; Chan, 2003); lack of a balanced approach (Beamon, 1999; Chan & Qi, 2003); not enough emphasis on customers and especially competitors (Beamon, 1999); loss of supply chain context, hence encouraging local development (Beamon, 1999) and lack of system thinking (Chan & Qi, 2003; Chan, 2003).

Furthermore, Hausman's (2002) Technique of order preference similarity to the ideal solution TOPSIS and Analytical Hierarchy process (AHP) have been used by many contemporary scholars to rank key performance indicators of a supply chain (Sillanpaa, 2015; Venkatesh et al., 2019; Tyagi, et al., 2018; Govindan et al., 2017; Moharamkhani et al., 2017). Furthermore, the Supply Chain Operations Reference (SCOR) was introduced by the Supply

Chain Council (Supply Chain Council, 1997) which lays out the following five basic supply chain management process: Plan, Source, Make, Deliver and recently includes Return (Vanany et al., 2004) and many scholars have developed supply chain key performance indicators (KPIs) and supply chain performance measurement framework and systems based on the foregoing SCOR five basic management process of a supply chain (Elgazzar, et al., 2019). Return is interpreted as customer feedback upon which customer satisfaction is measured (Lockamy & McCormack, 2004). Return is also interpreted as recycling which is based on the green supply chain literature (Lockamy & McCormack, 2004; Roy et al., 2020). Alongside KPIs, traffic light analysis is a scoring system which is also used to know and score the performance of the supply chain based on the indicators by showing which performance indicator is red, yellow, or green light (Vanany et al., 2004). Also, Lockamy & McCormack (2004) argues that the SCOR model also provides framework that is used to describe and characterize supply chain management practices and processes that result in best supply chain performance and that is why performance metrics and indicators are developed from SCOR. Other models that have been used for supply chain performance measurement include SCOR based fuzzy VIKOR approach (Oztaysi & Surer, 2013), fuzzy logic (Dissanayake, 2015), mathematical fuzzy set theory (Chan & Qi, 2003; Olugu & Wong, 2012), fuzzy AHP (Cho et al., 2012; El-baz, 2011), fuzzy DEMATEL (Decision making trial and evaluation laboratory- Govindan et al., 2015; Tyagi et al., 2015), interval valued fuzzy-rough approach (Roy et al., 2020) and fuzzy DEA (Data Envelopment Analysis- Khalili-Damghani et al., 2012; Tajbakhsh & Hassini, 2015). Furthermore, fuzzy AHP and TOPSIS have also been used as an integrated approach to measure and rate logistics performance. Kumar & Singh (2012) study which used an integrated fuzzy AHP and TOPSIS to evaluate the performance of global third-party logistics for effective supply chain management is one such example. However, contrary to developing general KPIs that are based on the five basic supply chain management processes, or measuring supply chain performance using models, theories, and analytical tools, Cuthbertson & Piotrowicz (2011) found out from an extensive review of the literature and illustrative case studies that supply chain performance

measurement process is context dependent. Cuthbertson & Piotrowicz (2011) further argues that the foregoing means that supply chain performance measurement is tailored to the specific supply chain requirements based on the industry and other socio-economic factors. Hence, they further argued that a supply chain performance measurement system is developed based on the context of the supply chain which influences both the development process and the content of the performance measurement system (Cuthbertson & Piotrowicz, 2011).

Yuen (2006) carried out research on 3PL organizational performance measurement in Hong Kong and argued that there is a lack of 3PL service performance measurement aimed at managing vendors and helping them achieve competitive advantage, cost reduction and efficiency in Hong Kong. Yuen (2006) further noted that there is a dearth of study on 3PL organizational performance in Hong Kong in terms of its effectiveness and measurement of its effectiveness in the supply chain. Yuen (2006) further went on to develop a model based on organizational theory to measure and explain the cause-and-effect relationship between 3PL and its service quality, its organizational effectiveness in the supply chain and its relationship management with service partners in the supply chain. Part of the study aim was to fill a gap in literature in Hong Kong and to provide insight on performance measurement and management of logistics outsourcing. The study findings confirm the multidimensional measurement capacity of 3PL performance which is based on organizational effectiveness in the supply chain, service quality and relationship management with supply chain partners (Knemeyer & Murphy, 2004). These three performance measurement criteria of 3PL were further broken down to 11 positive and significant dimensions. Also, Seong-Jong et al. (2013) carried out case-study research which was aimed at measuring the longitudinal performance of a branch (located in Northwest region of the USA) of a global 3PL company. The performance measurement was based on Data Envelopment Analysis (DEA) using pertinent internal data concerning the pick-up, movement, and delivery of freight. DEA is mostly used to measure and determine operational efficiency and has been applied in

different industries including third party logistics and supply chain management (Tajbakhsh & Hassini, 2015). The case-study report was for the purpose of comparative performance measurement of the branch in a 36-month period from 2005 to 2007 comparing the operational efficiency of the branch between each month within the 36 months period. Furthermore, Yeung (2006) carried out a study on the impact of third-party logistics performance on the logistics performance of users such as shippers and export performance of manufacturers and traders in Hong Kong. The study measured the logistics performance of 3PLs based on key performance indicators (KPIs) such as: delivery performance (in terms of timeliness of delivery), customer service, pricing, information technology and value-added and customized service. KPIs such as: flexibility, delivery reliability, cost efficiency, responsiveness and information and documentation. The foregoing performance indicators are compared with practices of major competitors within the industry. The users' export performance was measured through achievement of the company's export goals, relative export sales and growth performance, market share in target market and perception of profitability when compared to major competitors in the industry. Factor analysis was used to determine the level of relevance (high or low) of these performance indicators on the logistics and export performance of users as well as the logistics performance of 3PLs. The research findings show that 3PLs' timely service (especially delivery), pricing and quality of delivery handling are highly positively related to the logistics and/or export performance of users. Janne and Rudberg (2022) study found that third-party logistics companies enable their clients to achieve positive results in terms of logistics and project performance in the construction sector however the study notes that the major challenge to achieving the foregoing is the inclusive participation of all supply chain actors required to achieve a matured supply chain. Contrary to the foregoing, Solakivi et al. (2011) carried out a study on logistics outsourcing and company logistics performance of SMEs in Finland with evidence from 223 firms operating in Finland and the study found out that there is no evidence of profit or loss in logistics performance because of logistics outsourcing. Solakivi et al. (2011) further noted that logistics outsourcing does not necessarily result in automatic gains; rather

management should focus on analysing firm-specific characteristics that support or in some cases suffer from logistics outsourcing decisions.

2.6 Reasons for logistics outsourcing, theories of logistics outsourcing and outsourcing as a business strategy

Wan et al. (2019) carried out research in China to find out the strategic motivation for logistics outsourcing based on different types of logistics outsourcing. They noted that assets-based logistics outsourcing services such as outsourcing transportation and distribution to a third-party logistics company who will use their own fleet, distribution centres or warehouse to run the client's supply chain are motivated by internal logistics demands and external pressure to achieve logistics excellence. They also found out that non-asset-based logistics outsourcing is motivated by the need for external professional and competent management-based logistics services such as managing a company's warehouse or distribution centre by 3PL experts (Ketokivi and Mahoney, 2020). Zhuang (2012) who also carried out research in mainland China notes that 3PL management capabilities are positively associated with logistics outsourcing while internal production and operational capabilities or resources such as logistics infrastructure, logistics information systems or a company's internal logistics skills do not directly influence logistics outsourcing except through compelling interface capability such as 3PL management capability. Zhuang (2012) further notes that the pressure to outsource logistics is decreased when manufacturing companies are uncertain about their internal logistics requirements or needs or market uncertainty. Park (2017) argues that the magnitude of logistics outsourcing is much higher than in-house logistics in the USA. They further argued that logistics outsourcing is increasingly becoming a major governance choice which companies use for acquiring the required logistics capabilities and which requires specialized expertise in a more globalized and complex setting. Furthermore, Zailani et al. (2015) notes that transaction uncertainty (which is based on transaction cost economics theory) and the lack of human and physical

assets capabilities influences various levels of logistics outsourcing (Zhuang, 2012; Park, 2017). Zailani et al. (2015) also argues contrary to many other authors that cost reduction was not found to be one of the reasons for logistics outsourcing in their study rather most firms outsource their non-core logistics functions in response to transaction uncertainty (Wang et al., 2017). However, Zailani et al. (2015) study was focused on Malaysia and hence their findings were not generalized. Similarly, Kalinzi (2015) also argues in their study of logistics outsourcing in the Ugandan market that cost is not the ultimate reason for logistics outsourcing rather service-related reasons such as flexibility and 3PL competencies were found to be more prevalent.

Transaction cost economics (TCE): according to Slater & Spencer (2000) transaction or market uncertainty is one of the major factors that influence the decision whether to outsource or not and it is one of the foundations of the theory of transaction cost economics of the firm. Transaction cost economics of the firm is a theory that explains reasons why firms choose to outsource or not (Wang et al., 2017). According to Quelin & Motlow (1998) the notion of uncertainty in transaction cost economics theory refers to the difficulty in foreseeing the future even when a detailed contract of over 100 pages has been signed. These uncertainties basically refer to the following: market developments such as future prices and demand levels, changes in business environment such as new regulations and new industry players, innovations in technology and whether the parties involved in the contract will play their part. The foregoing uncertainties are positively correlated with the decision to outsource or not (Quelin & Motlow, 1998). Furthermore, as noted earlier that Kalinzi (2015) and Zailani et al. (2015) argued that cost reduction may not be the major reasons for outsourcing, Wang et al. (2017) similarly argues that transaction costs of outsourcing can nullify the costs savings benefits of outsourcing. They further argue that transaction cost economics of the firm is one of the few theories of outsourcing that has been used to explain why international outsourcing projects have often failed to fully achieve their cost-saving objectives.

According to Michael & Michael (2011) transaction cost economics of the firm (TCE) is a major theory of outsourcing that was developed by Coase (1960) which explains the firm as an economic system which operates by a governance structure (Williamson, 1998). The firm governance structure operates through an internal hierarchy, and it is an alternative governance structure to the market mechanism which is governed by price (Michael & Michael, 2011). According to Michael & Michael (2011) the theory further proposed that the problem of the firm is the combination of autonomous adaptation (which refers to response to market mechanism governed by price) and cooperative adaptation (which refers to the coordination required to govern itself within) (Williamson, 1998). Coase (1960) argues that when the value derived from using external market governance structure exceeds the cost of switching from the internal governance structure the firm will produce using the market mechanism hence outsource. Kalemci (2013) argues that transaction cost theory derives its assumptions from human behaviours which are based on the assertion that the firm operates based on “opportunism” and “bounded rationality”. The ultimate goal of the firm according to the aforementioned behavioural assumptions is to use the governance structure that will minimize the costs of transactions hence achieving the most efficient adaptive capability for the firm (Michael & Michael, 2011; Williamson, 1998). “Bounded rationality” and “opportunism” is explained in Michael & Michael (2011) as they argued that when the net gains after the transaction costs of productions is greater than the net gains of using an alternative governance structure to produce the same products the firm will use the first governance structure. In essence, transaction cost theory explains the make (produce in-house) or buy (outsource) choice of the firm (Quelin & Motlow, 1998; Ketokivi and Mahoney, 2020). Furthermore, according to the theory, the choice to make or buy depends on which one results in the most efficient adaptive capability for the firm (Quelin & Motlow, 1998). According to Hojnik (2010) transactional costs that a firm incurs when outsourcing consists of the following: cost of adaptation, negotiation cost, cost of relationship management and agency costs (Beimborn, 2006; Cuypers et al., 2021). Contrary to the foregoing, Dahlman (1979) notes that the transactional costs consist of the following: search and information

costs, bargaining or negotiations costs and policy and enforcement costs: (Rindfleisch, 2020; Michael & Michael 2011; Kalemci 2013; Dahlman 1979; Quelin & Motlow 1998; Williamson 2008; Williamson 1998; Coase 1960 and Coase 1937).

Resource-based view (RBV): according to Boxall (1996) the resource-based view of the firm is a theory that was founded and developed as an approach to business strategic management in the 1980s and 1990s. The theory is based on the concept that every firm has various kinds of tangible and intangible resources such as specialized knowledge, expertise, technology, experience, knowledge, location, data and information and processes. These resources when put together become capabilities which are viewed as a kind of resource some of which combined or on its own becomes a core competence or core competencies of the firm which is then viewed as strategic capabilities of the firm that provides sustainable competitive advantage for the firm. These core competencies of the firm are highly valuable, rare, and difficult for competitors to imitate hence giving the firm a competitive advantage over their competitors in the industry (Wernerfelt, 1984; Wernerfelt, 1995; Barney, 2001; Halldorsson & Skjott-larsen (2004). The main proponents of the theory are Wernerfelt (1984; 1995) and Barney (2001a; 2001b). Furthermore, RBV in later years became more focused in the human resource and firm performance literature based on strategic management and competitive advantage perspectives which postulates that a firm can gain competitive advantage by having a competent and effective human resource management team which then enables the firm to have a well competent, efficient and resourceful staff base that is highly valuable, rare and can hardly be imitated by competitors hence giving the firm an edge over its competitors (Fang et al., 2005; Alewell et al., 2007; Ordanini & Silvestri, 2008; Harris, 2009; Ferguson, 2006; Mayson & Barrett, 2006; Wright et al., 1994; Barney & Wright, 1998).

According to Espino-Rodriguez (2006) RBV has now recently become a major theory that is used to explain outsourcing and a much more recent theory that explains outsourcing from a more strategic perspective than transaction cost economics of the firm. Holcomb & Hitt

(2007) notes that Resource-based view of the firm has been used to examine how specialized capabilities can potentially be a source of value creation in outsourcing relationships between firms as a business strategy. They further noted that in supply chain management, only TCE and RBV have been used thus far to explain outsourcing relationships. However, Mclvor (2009) argues that neither RBV nor TCE are enough to explain the complexities of outsourcing relationships and decisions. Hence, RBV has also been used in combination with other outsourcing theories (not only TCE) not only in supply chain management but also in several other sectors by many scholars to explain outsourcing decisions. Strange (2011) views outsourcing as a hybrid of internal governance structure and external market governance structure arguing that firms' governance decisions are beyond just a dichotomy of governance structures which is contrary to the assumptions of TCE according to Coarse (1960). Hence, Strange (2011) in their study further combined the theories of RBV, TCE and resource dependency theory to explain why some firms outsource their primary or core activities and they further developed a set of propositions from these theories that generally explains firms' tendency to outsource. Contrary to the foregoing, Lahiri et al. (2022) study employing RBV theory, carried out a meta-analysis of 121 samples from 106 primary studies spanning 28 years and the study findings indicate that outsourcing is positively correlated with firm performance but that the association is stronger with non-core activities than core activities. Similarly, Dabhilkar (2011) in their study also used TCE and RBV to explain the trade-offs in make-buy or the decision to keep activities in-house or to outsource. Mazzanti et al. (2009) argues that based on their original research which was carried out in a local production system in Emilia-Romagna Italy, that transaction cost did not appear to be a major reason for outsourcing rather the major reason to outsource is based on resource-competence approach which is based on the resource-based view of the firm and factors such as tapping into the provider or third party technological innovation are among the arguments of resource-competence approach. Tsai et al. (2008) carried out a study on risk perceptions of logistics outsourcing among retail chains in Taiwan and found out that the risks perceptions of outsourcing logistics increase as the number of outsourced

functions increase. They used TCE and RBV to predict logistics outsourcing risks with particular focus on the distribution side of the supply chain. They further observed that the risks related to transaction costs (based on TCE) and strategic resources (based on RBV) were both significant and assets and competence risk were found to be more of a serious concern than relationship risks. Issues such as loss of control and information risk accounts majorly for asset risk while issues such as poor customer service competency and poor competence leverage make up competency risks. However, they noted that keeping logistics in-house equally shows significant risks as outsourcing them. Furthermore, Wirtz & Ehret (2009) argues that third party business providers such as 3PLs contribute to competitive advantage of their clients in the following three significant ways: first reducing the cost of asset ownership of their clients (based on property rights theory), second freeing up management capacity to focus on high value-creation activities and opportunities based on RBV (Lahiri et al., 2022) and enhancing their client's entrepreneurial leverage and abilities (based on entrepreneurial theory of the firm). Vyas (2016) did a study in Hong Kong about public sector outsourcing public services to private sector and they used RBV and TCE to analyse Hong Kong's Bureaucrat's and contractor's view on contract management. Dobrzykowski et al. (2010) developed a framework which considers the role of internal competencies and the role of external actors in creating value when making analysis for outsourcing decisions. The foregoing internal competencies and external actors are based on RBV and value co-creation theories respectively. They carried out a case study of an international US retail firm which revealed that a firm's successful outsourcing decision can be explained by RBV and value co-creation theories. According to their study RBV provides an internal view of the firm based on the firm's core competencies while value co-creation provides an external view of the firm by considering the role of customers when making outsourcing decisions thereby highlighting the role of internal competencies and external factors in making outsourcing decisions.

2.7 Types of third-party logistics contractual relationships and relationship management in third party logistics

Halldorsson & Skjott-larsen (2004) carried out a study which was aimed at developing a type of third-party logistics relationships which enables 3PLs to not only take advantage of possible competencies in a 3PL dyadic relationship but also to develop competencies through 3PL relationships (Vlachos, I. and Polichronidou, 2024). They further noted that there are single and complex types of relationships between 3PLs and their customers with the former being simple, most times informal, short term, focused on price, does not carry much commitment and are based on single logistics function outsourcing while the latter is based on multiple logistics functions outsourcing which are more complex, formal, with mutual obligations and of much more longer terms (Bowersox, 1990; Anderson and Norman, 2002; Darko and Vlachos, 2022). Halldorsson & Skjott-larsen (2004) further went on to describe the different levels of third-party logistics contractual relationships which are described in table 2.1 below.

Table 2.1: Levels of 3PL contractual relationships, source: (Halldorsson & Skjott-larsen 2004; Vlachos, I. and Polichronidou, 2024).

Levels of 3PL relationships	First level	Second level	Third level	Fourth level
Description	In the first level, the relationship between the 3pl and their clients are short-term, price focused, sometimes	In the next level, the 3pl company offers customized logistics solutions based on a broad	At the third level, the 3pl company and its client develop a unique relationship	In the fourth level, companies operate their logistics in-house but are managed by a

	adversarial and assets are not necessarily specified. The transactions are on the spot and the services offered by the 3pl company are standard skills services	range of standardized services from which the customer can choose its customized package. Assets are specified at low to medium level as services can easily be adjusted to other clients. Contract relationships are usually one year or less and information sharing and joint problem solving are limited as the focus of the client is basically cost	where both parties view the relationship as a win-win for both. The contracts are longer terms, information is shared, and problems are solved jointly. Furthermore, assets specificity is between medium to high which involves human assets such as knowledge and experience, personnel exchange, and physical assets such as it and warehouse facilities.	third party who manages the company's logistics. Assets are highly specified and belong to the company and logistics is seen as a core competence of the company hence requires management by experts so that the company can differentiate itself from its competitors (kalinzi, 2015). Such arrangement is based on TCE and the competency theory.

		efficiency and service improvements. The 3pl gains by economies of scale and scope.	Innovation in capabilities and the development of new competencies are very crucial in the relationship.	

Hofenk et al. (2011) examined the importance of contractual and relational elements on the effectiveness of third-party logistics outsourcing relationship. They argued that the level of contract formality and the thoroughness of contract negotiations, contract commitment and trust determine the effectiveness of a 3PL company-client outsourcing relationship. Their argument is that the more a 3PL contract is formal and thorough, with thorough negotiations and with commitments and trust the more effective a 3PL outsourcing relationship will be. Boyson et al. (1999) argues that unsuccessful logistics outsourcing relationships have been generally linked to flaws in the contractual agreement linking both parties involved, unclear goals and unrealistic expectations, internal sabotage by managers of the firm that is outsourcing. They further argued that the success of an outsourcing relationship depends a lot on the relationship management skills of the firm engaging an outsourcing company. Contrary to the foregoing, Darko and Vlachos, (2022) noted in a qualitative multiple case study that apart from managing the logistics and warehousing of customers, 3PL customers also expects 3PL companies to create additional value through decision making responsibilities such as managing the relationship between them. Knemeyer & Murphy (2004) in their study about evaluating the performance of a third-party logistics arrangement from a relationship marketing perspective note that there are 6 dimensions of a 3PL

relationship namely: trust, communication, opportunistic behaviour (price focused; exploitative), reputation, satisfactory prior interactions, and relationship specific investments. Similarly, Rossiter (2007) in their study about the determining factors of customer partnering behaviours in a 3PL relationship from a relationship marketing perspective, notes that a 3PL customer whose relationship with the 3PL is embedded in high levels of dependence, trust and satisfaction is more likely to exhibit traits of partnering behaviours with the 3PL which will be mutually beneficial to both parties. While Panayides (2006) argued that a third-party logistics arrangement with a relationship orientation is viewed as an antecedent to a more productive logistics outsourcing service with innovation which will in-turn improve firm performance (Vlachos and Dyra, 2020).

2.8 Logistics outsourcing and firm performance (firm business performance, supply chain performance and firm financial performance)

Awe et al. (2018) carried out a meta-analytic study using 24 articles and 51 empirical results to find out which type of outsourcing has the greatest impact on firm performance. The study examined the relationship between the 51 variables (empirical results from the 24 articles that were reviewed) and firm performance and the study found out that only I.T. outsourcing had a very significant impact on firm performance compared to other forms of outsourcing. Hence, based on the foregoing study logistics outsourcing does not necessarily have a significant impact on firm performance. However, some 3PLs such as TouchPath are specialized in offering logistics and supply chain I.T. solutions hence such a form of outsourcing may be classified under I.T. as well. Nevertheless, generalization cannot be made based on Awe et al. (2018) as their methodology was limited to secondary data analysis and no original primary data-based research was done. Also, Solakivi et al. (2011) carried out original research on logistics outsourcing and firm performance in Finland

gathering data from 223 manufacturing and trading SMEs in Finland and similar results with awe et al. (2018) were found. The study found out that there was no significant gain or loss in firm logistics performance because of logistics outsourcing (Aziz et al., 2020). The study also found out that I.T logistics outsourcing was among the areas of logistics outsourcing with greater growth expectations. Solakivi et al. (2011) study concluded that in general terms that companies who outsource their logistics should not expect automatic gains from logistics outsourcing but should rather analyze their company specific characteristics that support logistics outsourcing or in some cases suffer from it. Again, the findings of Solakivi et al. (2011) cannot be generalized as it is limited to SMEs and does not incorporate large companies, and it is also limited to SMEs in Finland only. In contrast to the foregoing, Lahiri et al. (2022) carried out a meta-analysis of 121 samples from 106 primary studies spanning 28 years and the study findings indicate that outsourcing is positively correlated with firm performance. Leuschner et al. (2014) argues in their meta-analytic review and investigation of third-party logistics and its impact on firm performance that there is a positive and significant correlation between relational governance in logistics outsourcing and firm's operational and financial performance. They argument is that the more relational, collaborative, and cooperative a third-party relationship between a 3PL and their customer is the more they are enabled to work closely to improve logistics customer service which in turn improves overall firm performance. According to their study overall firm performance includes operational, financial and market performance. The study findings suggest that a relational governance structure (which is based on trust, collaborative, and relational-cooperative norms) in a 3PL relationship is more likely to improve firm performance in other ways such as innovation which is positively correlated with all three forms of firm performance. Therefore, the foregoing suggests that relationship management in logistics outsourcing can have positive impact on firm performance and a 3PL arrangement that is governed based on relational governance structure will lead to enhanced 3PL customer service and innovation which will improve overall firm (3PL customer) performance. Again, however the study cannot be generalized as it is based on secondary data analysis and no

original primary data-based research was done. The foregoing findings by Leuschner et al. (2014) is similar to the findings of Jayaram and tan (2010) whose study findings notes that information integration, 3PL selection criteria and performance evaluation as well as relationship building with 3PLs are positively correlated with firm performance. The foregoing therefore suggests that good relationship management with 3PLs positively affects firm performance.

Furthermore, Yeung et al. (2012) carried out research in Hong Kong and the pearl river delta region of China where the impact of third-party logistics capabilities on exporters' performance were examined. The RBV was used as theoretical lenses upon which a research model grounded in the outsourcing-competitive advantage-performance paradigm was developed. Primary data was collected from 150 exporters in Hong Kong and the pearl river delta region of China. The study found out that exporters had a strategic orientation towards their 3PL providers and that there is a positive relationship between 3pl capabilities, exporters' competitive advantage and exporters' export performance. Agburu et al. (2017) carried out research on the effect of outsourcing strategies on the performance of SMEs in Benue state northern Nigeria. The study found out that outsourcing of primary activities which included logistics activities such as warehousing and customer service have a significant effect on the profitability of SMEs as an organization. Primary data was collected from 233 SMEs in various sectors and secondary data was collected from 10 selected SMEs. Mageto et al. (2018) noted that logistics outsourcing can help SMEs in Kenya to improve their logistics operations performance if SMEs adopt the appropriate logistics outsourcing strategies. The study further notes that many SMEs in Kenya have high logistics costs because very low percentage of their logistics activities are outsourced but that the narrative will be the opposite if they outsource majority of their logistics activities. Also, Muslimin et al. (2015) noted that there are few previous studies on third party logistics and firm business performance especially financial performance however these studies have found a strong relationship between logistics and financial performance. The study was

carried out in Indonesia, primary data was gathered from 120 questionnaires which was filled and returned out of 150 questionnaires that was sent out to SMEs. The study used independent variables such as logistics cost, service quality, security, reliability, and flexibility to determine the relationship between third party logistics and financial performance of SMEs Indonesia. The study findings indicate that logistics cost and service quality are positively correlated with financial performance of SMEs in Indonesia while flexibility, reliability and security are negatively correlated with financial performance of SMEs in Indonesia. Furthermore, in a similar study, Rajesh et al. (2011) carried out research on the influence of 3PL offerings on their client's performance in India. The study developed a research model and analysed four research hypotheses empirically using multiple regression analysis. The study aimed at examining in the context of outsourcing the effects of improving the performance indicators of a client because of the services offered by 3PLs. The study findings indicate that there is a positive influence in the performance indicators for companies who are associated with 3PLs. The study findings also indicate that 3PL clients distinguish 3PLs as a source that potentially provides them a pathway to a more innovative business model which will ultimately improve performance. Ghijsen et al. (2009) carried out a study on the role of trust in modern 3PL services in China. The study linked trust, it, logistics outsourcing and customer relationship. The study found out that it and 3PL usage has an influence on firms' end customer service performance (Luke & Waugh, 2011) which consequently leads to customer satisfaction and loyalty which is built over time based on trust. Furthermore, the study found out that logistics outsourcing seems to have a positive influence on the service performance of 3PL clients which in turn improves the customer relationship between end customers and 3PL customers. The foregoing leads to customer satisfaction and loyalty which is built on trust.

Hence, based on the foregoing there is no consensus on whether logistics outsourcing certainly improves firm performance rather in many cases; several factors in the outsourcing arrangement and relationship management will determine the impact of a 3PL arrangement

on firm performance (Leuschner et al., 2014). However, in some cases even when the outsourcing relationship is well managed, evidence has shown that outsourcing logistics does not necessarily have any positive correlation with firm performance (Solakivi et al., 2011). Hence, some studies have shown that there are problems and risks inherently associated with logistics outsourcing that may impede the expected benefits of logistics outsourcing.

However, Premkumar et al. (2020) systematic literature review noted that the third-party logistics future research should focus on how 3PLS can leverage employees and provide added value to shippers. Premkumar et al. (2020) further noted that the third-party logistics research should also focus on supply chain transformation through improved logistics optimisation and improved integration across the supply chain. The foregoing are areas of research gaps identified by Premkumar et al. (2020) relating to third-party logistics outsourcing and firm performance.

2.9 General problems, challenges and risks associated with third party logistics/logistics outsourcing

Ansari and Modarress (2010) investigated the challenges of outsourcing logistics to third party logistics providers. The study collected data through a mail survey from 126 shippers and personal interviews from eight shipper executives and four 3PL executives. The study findings indicate that the main problems with logistics outsourcing include first finding a 3PL company with the required capabilities to meet the shipper's logistics needs, second the incompatibility of information systems between the shipper and the 3PL, the inability of most 3PL to meet shippers' future growth needs and security related issues. Luke and Waugh (2011) notes that among the serious issues encountered by many manufacturing firms using the servicers of 3PLs in South Africa are: inadequate managerial involvement in the logistics outsourcing process, problems with transitioning of resources to 3PLs and problems of

managing the on-going 3PL relationship. Hence, the study recommends that a thorough outsourcing arrangement and process should be adhered to gain the expected benefits of logistics. Gadde and Hulthen (2009) argues that many 3PL contracts has been a source of corporate failure and disappointment (Boyson et al., 1999) and that increased interaction between firms and 3PL providers will improve the outcome of logistics outsourcing which also means that relationship management is very crucial to the success of logistics outsourcing arrangements (Jayaram and Tan, 2010). The aim of the study was to explore the reasons behind the problems of logistics outsourcing. The study findings indicate that inadequate interactions between 3PL and their clients is the major reason behind the problems of logistics outsourcing.

Kalinzi (2016) did research on logistics outsourcing and supply chain efficiency with a critical case study of Mukwano group of companies in Uganda. The study found the following risks associated with outsourcing logistics:

- First is the risk of relying on 3PL to fulfil its part of the contract and relying on information/data from 3PL to judge whether they are keeping to their part of the contract.
- Second is the issue of trust in terms of truthful declaration of correct costs incurred while rendering service by the 3PL that is risk of inflating costs and/hidden charges.
- Third, the risks become higher when all logistics functions are outsourced. The risks of losing entire internal logistics skills hence not capable to judge the 3PL outsourcing performance.
- The third risk can potentially lead to the beginning of opportunistic behaviour from the 3PL company and
- The complexity of coordination (coordination between the two parties is a necessary requirement in an outsourcing arrangement) depending on the context of the relationship could be a serious problem in achieving the goals of the outsourcing

contract. However, this last risk highlighted by Kalinzi (2016) is not clear and specific hence not reliable information.

Kalinzi (2016) further notes that to prevent the foregoing potential opportunistic behaviour, control mechanisms must be added in the contract. Furthermore, Kalinzi (2016) added that general risks of outsourcing according to literature are as follows:

- Possibility of loss of management control.
- Possibility of hidden costs.
- Threat to security and confidentiality.
- Different cultural approaches.
- Villani and Greco (2018) also highlighted reputation risks in the case where the third party performs poorly in areas such as delivery and end customer service which may negatively affect the reputation and brand name of the outsourcing firm.

Furthermore, Lai et al. (2013) argues that logistics outsourcing in many cases results in the risk of firms depending on 3PLs for better financial performance. The study drew on Resource dependency theory while data was collected from 134 3PL customers in China. The study proposed and confirmed after empirical testing was done that inter-organizational relationships and logistics integration are two effective methods for 3PL customers to cope, manage and leverage on their dependence on 3PLs so that they are not at a disadvantage rather they can improve their financial performance through their dependence. The foregoing also helps prevent the case of opportunistic behaviours by 3PLs. On the other hand, the study by Gabriel and Parthiban (2020) found from a review of literature that many papers identified the following top three main challenges that organisations who outsource their logistics to 3PLs face to be issues with shortening the lead time to the minimal, issues with adapting to the dynamics of the industry and adapting to advancement in technologies.

Tsai et al (2012) argues that there are dark sides to logistics outsourcing. They noted that the dark sides refer to the risks associated with logistics outsourcing which in their study was

highlighted to be asset risks (Kalinzi, 2016), competency (Kalinzi, 2016) and relationship risks. The study further notes that good relationship management by the purchasing firm can help mitigate assets and competency risks. Furthermore, in recent years many authors have done thorough research and investigation on the 'dark side' of business relationships specifically customer-supplier B2B (business to business) relationships with the aim of focusing more and critiquing the dark sides of business relationship as it potentially has greater influence of contributing to successful business relationships than focusing on the positive areas (Abosag et al., 2016; Johnsen & Lacoste, 2016; Fang et al., 2011; Chowdhury et al., 2016; Huang et al., 2019; Shi et al., 2019; Rahman et al., 2019; Shi et al., 2020).

2.10 Third party selection criteria and third-party decision-making framework

There has been a proliferation of literature on third party logistics selection criteria and third-party decision making and selection framework/tool by scholars all over the world. While Ansari and Modarress (2010) notes that one of the major challenges with outsourcing logistics to a third party is been able to find the right 3PL company with the required skills and competence to meet the logistics needs of the firm, Jayaram and Tan (2010) also notes in their study that 3PL selection criteria among other factors are positively correlated with firm performance. Many of the literatures have used tools, frameworks, evaluative models, and metrics to propose strategies for selecting a suitable 3PL company. Others have developed theoretical frameworks and models upon which firms can make informed decisions when choosing a 3PL. Also, many of these studies have been carried out as a case study in different parts of the world where country specific frameworks and tools have been developed to guide firms who may contemplate to use the services a third-party logistics firm in those countries. Table 2.2 below is a table with categories of third-party selection criteria along with their academic authors.

Table 2.2: summary of the different models, frameworks, and methods which academic authors have proposed in the past for effective third-party logistics provider selection criteria.

TYPES OF THIRD-PARTY SELECTION CRITERIA	Academic authors
Framework for third party logistics company evaluation/selection and models of logistics outsourcing strategy and selection/evaluation.	Vaidyanathan (2005); Sink and Langley (1997); Maltz and Ellram (1997); Alkhatib et al. (2015); Meade and Sarkis (2002); Mello et al. (2008); Isiklar et al. (2007); Mello (2006); Li et al. (2012); Soh (2009); Anderson et al. (2011); Ecer (2018).
Multi criteria decision making methods for selecting third party logistics service providers.	Ozbek and Eren, (2013); Alkhatib et al. (2015); Akman and Baynal (2014); Karrapan et al. (2017); Narkhede et al. (2017); Wen et al. (2019); Raut et al. (2018); Aguezzoul (2014); Soh (2009); Aguezzoul (2007).
Fuzzy analytical hierarchy process (FAHP) and Technique of order preference similarity to the ideal solution (TOPSIS)	Soh (2009); Chiang and Tzeng (2009); Ecer (2018); Sudrajat et al. (2019); Eldemire (2016); Singh et al. (2018); Akaaboune et al. (2018); Akman and Baynal (2014).
Other metrics: such as Data envelopment analysis (DEA), Decision making trial and evaluation laboratory (DEMATEL), Evaluation based on distance from average solution (EDAS), Interpretive ranking process (IRP), Organizational effective	Govindan et al. (2016); Ecer (2018); Narkhede et al. (2017); Akaaboune et al. (2018); Karbassi-Yazdi et al. (2018); Coltman et al. (2011); Wang et al. (2021).

model (OEM), Evaluation by an area-based method for ranking (EAMR), Analytic network process (ANP), VIKOR, Shannon Entropy based approach, Best-worst scaling approach based on DCA (Discrete choice analysis).	

Vaidyanathan (2005) proposed an evaluation criteria framework for selecting third party logistics provider which was based on the following factors:

- IT (a list of IT services that are provided by 3PLs were made, for more information see Vaidyanathan, 2005).
- Quality: this is referred to whether the 3PL company is complaint to the FAA/FDA compliance requirement for warehousing, ISO compliance requirement for storing, packaging, picking, shipping, delivery, handling, and other requirements, as well as six sigma and commitment to continuous improvement and compliance to training procedures.
- Performance: historical performance measured by Just-in-Time deliveries, delivery turn-around time (DTT), historical performance in terms of lead time, accuracy in demand forecasts, shipment errors recorded in the past and other related performance indicators
- Services: such as physical warehousing services, warehousing security and scalability, order management metrics, transport management metrics, tracking services, delivery and reverse logistics, customer support services, inventory management services and other related services.
- Cost: cost of IT, warehousing, transportation, inventory management and other logistics service provision costs

- Intangibles: Vaidyanathan (2005) notes that intangibles refer to questions regarding the business growth of the prospective 3PL provider to ensure that they will continue in business. The foregoing refers to issues such as financial stability, strong profitability, and global scope.

Unlike the foregoing selection criteria framework, Li et al. (2012) framework was purely based on mathematical fuzzy sets analysis (see Li et al. (2012). Meade and Sarkis developed a conceptual model which was focused on selecting 3PL providers who provide reverse logistics services, but their selection criteria are quite different from those of Vaidyanathan (2005) owing mostly to the nature of the logistics services offered by third party reverse logistics providers. The criteria are summarized as follows: product lifecycle position, traditional organizational performance metrics of third-party reverse logistics providers, reverse logistics process functions and the organizational role of reverse logistics to the outsourcing firm (refers to the purpose of embarking on a specific type of reverse logistics). Also, contrary to Vaidyanathan (2005) Mello et al. (2008) argues that while traditional 3PL selection prescriptive models and frameworks have been developed by many scholars in the past which are mainly based on traditional systematic, proactive, strategic-competence-driven process, other scholars have observed that in reality most firms have made their 3PL selection decision based on local, reactive, ad-hoc (specific to the business environment), and relatively limited-strategy-driven processes. The findings of their study further suggest that while the traditional prescriptive models have provided cognitive approaches to choosing a 3PL provider, companies have in reality used both cognitive and experiential search and evaluation to make 3PL provider selection decisions. However, contrary to the foregoing, Samgam and Shee (2017) study of 3PL selection in India asserts that strategic outsourcing objectives influence and determine the selection criteria of 3PLs in India.

Ozbek and Eren, (2013) argue that based on literature, 3PL provider selection is a multiple criteria decision-making problem which requires the consideration of multiple factors and hence 3PLs are chosen based on which possess the most criteria. Also, Hwang and Shen (2015) noted that MCDMM always assumes independence among the criteria and additive importance in weights. In some other cases, the integration of some methods such as FAHP and TOPSIS, or FAHP, DEA and EDAS or FAHP and VIKOR are a multi criteria decision making method (Akman and Baynal, 2014; Ecer, 2018; wen et al., 2019; Wang et al. 2021). Many other methods have been used by scholars, some of which are DEMATEL, EDAS, DEA, IRP, OEM, ANP, VIKOR, DCA and best-worst scaling approach (information on these methods are found in the references that are provided in table 2). For example, Yuan et al. (2022) carried out research that focused on the emergence of logistics outsourcing by ecommerce businesses. The research aimed at solving third-party logistics selection decision making problems associated with uncertain information. The study used DEMATEL to allow some kinds of relationship between decision criteria and calculates the weights of each criterion in multi-criteria decision making (MCDM) problems. The research then used a probabilistic complex proportional assessment method to solve the MCDM problems under the lens of probabilistic linguistics environment. The foregoing required less computational methods compared to other MCDM methods. The proposed method is applied in an example of a 3PL selection process using the method to demonstrate the applicability and effectiveness of the method (Chen et al., 2021). Other scholars have proposed 3PL selection through different approaches such as Jung (2017) who proposed an evaluation method for 3PL selection based on social sustainability criteria (Raut et al., 2018; Roy et al., 2020; Akpınar, 2021) and Riaz et al. (2021) who used linear Diophantine fuzzy prioritized aggregation operators to propose a method for selecting 3PL for optimisation of reversed logistics (Riaz and Farid, 2022). Also, Gotzamani et al. (2010) study on 3PL selection was focused and based on quality management and financial performance criteria. While Maltz and Ellram (1997) proposed a framework for 3PL selection and decision making that was based on the total cost of 3PL relationship. While Özcan and Ahıskalı (2020) proposed a

goal programming (GP) model which helps organisations determine which service provider to choose for which order, considering priority values for the order based on criteria such as mode of conveyance, transportation channel and the quantity of the order. The priority values for each order are calculated by ranking the foregoing criteria using AHP and determining the ideal 3PL out of 5 optional 3PLs using TOPSIS. According to Ozcan and Ahiskali (2020) the method is novel as it is the first been proposed in the literature. Also, the method was applied in selecting the appropriate 3PLs for a company that employs multi-modal international transport, and the result indicates an improvement rate of about 7% in terms of on time delivery, 33% improvement in terms of bid - bill consistency rate, and about 29% reduction in problematic delivery rate compared to the previous one year.

Finally, karrapan et al. (2017) carried out a study in south Africa to determine the critical selection and ranking criteria upon which a south African country specific 3PL benchmarking index was created which may be used to evaluate 3PLs in south Africa for selection/decision making purposes. Data was collected from 103 valid responses (46% response) and the respondents were represented from companies in various sectors who outsource some or all their logistics functions to 3PLs in south Africa. Though the selection criteria were based on criteria ranking, the study did not use AHP or TOPSIS rather the criteria ranking was based on frequency of occurrence in the survey analysis and mean score. Below is an illustration in their study which shows the ranking of criteria based on mean scores according to their study:

Code	Top 25 selection criteria	Frequency N	Mean	Standard deviation
A7.6	Commitment to continuous improvement from the 3PL service provider	98	4.55	0.675
A3.8	Ability of the 3PL service provider to provide valued added services	99	4.52	0.629
A6.9	Information management and reporting	99	4.49	0.629
A1.6	Demonstration of innovation by the 3PL service provider	99	4.47	0.705
A6.8	Information network security	99	4.38	0.634
A2.4	Sharing of risks between this organisation and the service provider	98	4.38	0.780
A3.2	Ability of the 3PL service provider to provide customised service	99	4.34	0.785
A5.1	Adherence to the contract	99	4.27	0.603
A3.3	Geographical coverage of the 3PL service provider	99	4.21	0.594
A5.4	On-time shipment and deliveries	99	4.18	0.787
A1.4	Accessibility of top management of the 3PL service provider	99	4.17	0.686
A5.3	Accuracy of delivery	99	4.16	0.854
A5.5	Low error rates	99	4.13	0.888
A4.2	Cost savings offered by the 3PL service provider	97	4.12	0.462
A6.7	Information network accessibility	99	4.12	0.674
A7.4	Regulation compliance, e.g. B-BBEE status, risk management (OHS Act)	99	4.12	0.812
A4.5	Low operation costs of the 3PL service provider	98	4.08	0.821
A7.1	Quality of management by the 3PL service provider	99	4.07	0.824
A2.5	Sharing of rewards between this organisation and the 3PL service provider	98	4.05	0.778
A4.1	Favourable price structure of the 3PL service provider	98	4.01	0.696
A7.5	Compliance to environmental requirements by the 3PL provider	99	3.97	0.851
A5.2	Speed of delivery	99	3.96	0.768
A2.3	Trust between this organisation and the 3PL service provider	99	3.95	0.705
A1.3	Financial stability of the 3PL provider	99	3.93	0.689
A3.1	Range and level of 3PL service offerings	98	3.93	0.911

Figure 2.2: Rank of criteria based on mean score, adapted from Karrapan et al. (2017)

2.11 Logistics outsourcing usage in developed countries of US, Canada, Australia, Europe, Japan, and the UK

Kalinzi (2015) notes that as at 2002 according to a survey report by Ernest and Young and Cap Gemini, logistics outsourcing in Europe reached 94%, 78% in north America and 92% in pacific Asia showing high usage in advanced countries of Europe, north America and Australia and New Zealand as well as Chinese territories such as Hong Kong while, Menon et al. (1998) reports that there are over 1500 3PL providers in Canada, Mexico and the united states. This section will review more recent literature that focused on these and other advanced regions of the world with the aim to find out the current scale of logistics outsourcing in these regions, why firms outsource logistics and benefits they gain from outsourcing their logistics activities if any.

Nunez-Carballosa and Guitart-tarres (2011) carried out a study which was aimed at analysing the use of logistics outsourcing in Spain from the perspective of a 3PL provider. The study methodology was a case study of four 3PL providers in Spain who operate in different sectors with the aim to establish why companies in these sectors outsource their logistics to a third party. The biggest 3PL company that was studied is a subsidiary of a British company with a gross turnover of €415.91 million. The 3PL firm is a global player and provides logistics and supply chain management services to companies in the automotive sector. The case study findings indicate that the reasons why companies outsource their logistics to this 3PL firm is first because they lack the specific knowledge of customs, tax regulations and the infrastructure of destination countries. Secondly it allows these automobile companies to focus on manufacturing and selling their products and thirdly these firms see logistics competence as a major factor in achieving competitive advantage hence they outsource their logistics to experts. The three other 3PL providers have various reasons why firms outsource their logistics which is summarized along with the first company below in table 2.3:

Table 2.3: Reasons for outsourcing logistics by four case study companies in Spain, source: Nunez Carballosa and Guitart-tarres (2011).

3PL companies	Sector	Reasons why companies outsource logistics
Company A (a British subsidiary, a global player, supplies automobile parts, manages clusters of suppliers, provides other logistics services, manages just-in-time production for	Automotive sector	Firms lack specific knowledge of customs, tax regulations and infrastructure of destination countries. Also, it allows firms to focus on core activities and it enables

clients such as ford, Mercedes, Chrysler, Nissan, and Volkswagen group)		outsourcing firms to gain logistics competence which helps to achieve competitive advantage.
Company B (specialist in garment processing, inventory management and national and international distribution)	Textile sector	Cut costs, service improvement, efficient operations, expertise, turning fixed costs into variable cost thereby achieving flexibility
Company C (a custom built 3PL provider for three pharmaceutical companies namely: Bayer, Novartis and Boehringer Ingelheim. Provider warehousing and distribution services for these pharmaceutical firms in the Iberian Peninsula)	Pharmaceutical sector	Increasing need for logistics outsourcing in the pharmaceutical industry in Spain. Also, optimal warehousing of medication requires special kind of facilities, specific hygiene and temperature controls, strict adherence to expiry dates, strict control of labelling on packaged medications and adherence to regulations.
Company D (started as a transport company but now has grown to become a 3PL provider specialized in	Retail and consumer goods sector	To cut logistics costs, second to focus on business core activities which logistics is not among them

distribution to large-scale retailers)		and third to benefit from the know-how of external experts

Solakivi et al. (2011) carried out a study on logistics outsourcing and company performance of SMEs in Finland and collected primary data from 223 manufacturing and trading SMEs in Finland who outsource their logistics to a 3PL provider showing very high usage of third-party logistics in the country. However, the study findings show that logistics outsourcing did not affect the logistics performance of these firms in terms of loss or gain (Aziz et al., 2020). Nevertheless, the study reports that logistics outsourcing is expected to grow in all areas of logistics, particularly in I.T, materials management, and value-added services.

Rahman (2011) studied logistics outsourcing in Australia with the aim to find out the extent to which firms outsource their logistics, the motivation to outsource and the impact of logistics outsourcing on customer satisfaction, logistics cost and on the morale of the 3PL clients' employees. Also, to find out the average length of logistics contracts and the types of logistics that are outsourced. Data were collected from 210 firms which were listed among the Dun and Bradstreet's 500 largest Australian firms however banks, insurance companies and other financial institutions and real estate firms as well were excluded from the list. The study findings show that warehousing, fleet management and order fulfilment were the most outsourced logistics functions while the three major factors why firms outsourced were to reduce costs, to reduce capital investment and to improve operational flexibility. The study findings further show that 86% of firms are satisfied with the services of 3PLs and this is also reflected in the fact that they will continue to use 3PL services. Similar to the foregoing, Chang et al. (2024) shows that that the growth of Ecommerce is increasing the demand for outsourcing order fulfilment to third-party logistics firms. However, on-demand warehouse business to business model is growing recently and reducing the demand for outsourcing warehouse management to 3PLs (Tornese et al., 2020).

Hilletofth and Hilmola (2010) studied the role of logistics outsourcing in supply chain management and strategy in terms of supply chain integration with survey findings from northern Europe. Survey research was completed in Finland and Sweden with 34 responses from large-scale industrial and trading companies. The study findings show that warehousing, I.T. and customs brokerages outsource possibly have an impact on managerial and strategic areas of the supply chain. Areas of supply chain strategy and management (Spillan et al., 2022) that are referred to are integrated manufacturing and logistics I.T. systems, reverse logistics procedures and re-engineering of logistics process. The study further shows that in-house I.T. functions integrated with outsourced warehousing could potentially play more strategic roles in international purchasing. Other studies in these regions which are reviewed in this research are summarized in table 2.4 below:

Table 2.4: Selected Third-party Logistics Studies in selected developed countries.

No	Authors	Country/region studied	Summary of study
1.	Van Doorn (2010)	Netherlands	Explores the influence of power and dependency theories on outsourcing decisions and its importance when compared to other factors that influence logistics outsourcing. A case study of the Dutch pharmaceutical industry
2.	Kavcic et al. (2016)	Slovenia	Investigates how logistics outsourcing activities that were previously done in-house are currently done by 3PLs. Evidence from Slovenia

3.	Malakoti-Negad (2016)	Canada	3PL usage in Canada. Studied strategies that SMEs may use to engage 3PLs which may help SMEs to increase their chances of survival in Canada, create more employment, pay more taxes as they generate more income
4.	Murphy and Poist (1998)	USA	General study of 3PL usage in the USA with focus on propositions concerning logistics outsourcing in the USA such as most firms that do not use 3PLS are likely to be very large firms or very small firms
5.	Rakovska (2016)	Bulgaria	Investigates the characteristics of logistics outsourcing in Bulgaria from the perspectives of both the 3PL provider and the customers. Compare their (3PLs and customers) perspectives on motives of outsourcing, to assess the relationship between communications and relationship management, with customer satisfaction
6.	Ahn et al. (2013)	Korea and Japan	A comparative study of the 3PL industry in Korea and Japan. It is a market report.

7.	Liu and Lyon (2011)	UK and Taiwan	Focused on assessing the relationship between the service capabilities and performance of 3PLs in the UK and Taiwan
8.	Selviaridis et al. (2008)	UK	Studied the benefits, risks, selection criteria and success factors for 3PL services in the UK
9.	Sankaran et al. (2002)	New Zealand	A thorough investigation into third party logistics in New Zealand with the aim to reveal managerial insights into effective logistics outsourcing that are specific to the context of New Zealand.
10.	Min (2013)	USA	Studied logistics outsourcing practices in the us, identifying key factors influencing logistics outsourcing decisions in the us and provides insights for effective logistics outsourcing for firms who may contemplate the use of 3PL
11.	Cichosz et al. (2017)	Europe and America	Studied innovation in logistics outsourcing relationship with the aim of customer satisfaction. Preliminary study in America and case studies of 3PL usage in Europe.

12.	Miyashita (2015)	Japan	Studied to find out the two Asian superior import hubs for Japan based on the business power of Japanese 3PLs and the logistical environment catch-up speed of these countries
13.	Piplani et al. (2004)	Singapore	Focused on the use of I.T. by third party logistics providers in Singapore
14.	Sinkovics et al. (2018)	UK	Studied value co-creation in outsourcing arrangements between manufacturers and 3PLs in the UK. The study focused on resource commitment, innovation, and collaboration
15.	Maas et al. (2017)	Germany	Focused on the economic impact of environmental practices within the German third party logistics industry
16.	Hrušecká et al. (2015)	Czech Republic	Studied the use of 3PL logistics from the perspective of 3PL customers (manufacturers) in Czech Republic with the aim to show that logistics activities are rigorously used in Czech Republic compared to other regions of the world

17.	Bolumole (2001)	UK	Focused on petrol retailers in the UK who use 3PL to provide supply chain solutions to their convenience-goods stores with the aim to identify factors that influence logistics outsourcing decisions and the supply chain impact of outsourcing strategies.

2.12 Impact of logistics outsourcing on business performance in selected developing regions

Charles and Ochieng (2023) carried out a systematic literature review of the impact of strategic outsourcing on firm performance and noted that there is limited research on influence of strategic outsourcing on firm performance in developing countries.

Sahay and Mohan (2006) carried out a study about the usage of 3PL activities in India and the impact of 3PL practice on business performance in India. The study found out that any positive and/or significant impact of 3PL services on business performance in India is still at its potential state. However, the study also found out that there are plans to increase the third-party logistics activities across all logistics functions between then and 2011 (Sahay & Mohan, 2006). Asthana et al. (2015) carried out a study about the business performance measurement of third-party logistics companies in the Indian logistics industry. The study explored the relationship between 3PL companies and upstream and downstream supply chain partners. The foregoing relation between 3PL and their supply chain partners was determined through the following performance variables namely: service quality, relationship management and organizational effectiveness and how these variables impact the performance levels of third-party logistics firms in India. The study noted that effectiveness and efficiency are the two basic parameters that are used to measure the performance

levels of organizations. The study further noted that performance in logistics and supply chain is measured by evaluating the constituent parts of an organization's logistics or its supply chain using effectiveness and efficiency as criteria and/or through social referent criteria measuring how well the constituent parts of an organization meet their goals and aspirations. The results of the study which used correlation coefficient to analyse and interpret data shows that the organizational effectiveness of 3PLs has a positive correlation with its service quality and its relationship management with its supply chain partners both upstream and downstream. Also, the study results show that relationship management of the 3PL firms in India is positively correlated with its business performance with their supply chain partners. Furthermore, the study results also show that the service performance of 3PLs has a positive correlation with its business performance with its supply chain partners.

Kariko (2012) researched logistics outsourcing and supply chain performance with a case study of universities in Nairobi through a survey of these universities' logistics outsourcing practices. Data was collected through self-administered questionnaires and was analysed using descriptive statistics and regression analysis. The study findings show that transport within each university or house transport was the most outsourced logistics among the universities and there was evidence that logistics outsourcing improved their supply chains. The study also found out that all surveyed university outsourced their logistics but at various levels and degrees and that there is always a strategic drive towards logistics outsourcing as a strategy to achieve cost efficiency, gain competitive advantage and reduce risks by focusing on core competencies. Macharia et al. (2016) carried out research that investigated the influence of logistics outsourcing on project performance of oil and gas companies in Kenya. The study found out that the most important benefit of outsourcing logistics is to restructure distribution network and to achieve competitive advantage. The study further noted that logistics outsourcing is a strategy that reduces costs and spreads risks among the participants of the contract. The study used questionnaires to gather data from 71 oil and gas players in Kenya and data was analysed using product moment correlation, descriptive

statistics, and regression analysis. The study also found that there was a positive correlation between logistics outsourcing (transportation outsourcing) and oil and gas projects and a weak positive correlation between inventory management outsourcing and oil and gas projects. Mageto et al. (2020) carried out research aimed at establishing the key determinants of logistics outsourcing performance and how these are related specifically with the logistics performance of small and medium manufacturing enterprises (SMMEs). The rationale of the study is based on the increasing use of logistics outsourcing and the challenges associated. Hence, SMMEs need to establish the related factors that determine high outsourcing performance to enhance overall logistics performance. The study collected data from 406 manufacturing SMEs using a structured questionnaire. The study applied factor analysis and extracted four constructs; three of which were found to be determinants. The study further used partial least squares structural equation modelling to determine how the constructs are associated. The findings indicates that communication-trust, innovation and cooperation between the logistics service providers and the manufacturing SMEs were identified as key determinants of logistics outsourcing performance however only communication-trust had a positive correlation with logistics performance.

Horsefall et al. (2018) carried out a study which compared between the impact of logistics outsourcing and in-house logistics on customer satisfaction in Nigeria in terms of speed of service delivery, service flexibility, service dependability and service effectiveness. The study used a questionnaire to collect data from 800 customers of ten manufacturing companies outsourcing their logistics and ten manufacturing companies that keep their logistics activities in-house. Using survey design, data was collected through convenience sampling technique and was analysed using descriptive and inferential statistics. The results of the analysis showed that in service delivery, the average mean score value of customers of companies who outsource logistics is higher at 13.96 than the average mean score value at 11.63 of the customers of companies who do not outsource logistics. In service flexibility, the results showed that the mean score value at 12.72 of customers of companies who

outsource logistics is greater than the average mean score value at 10.74 of customers of companies who do not outsource logistics. In service dependability and effectiveness, the results showed that the mean score value of customers of companies who keep logistics in-house is greater at 13.96 than the mean score value of customers who outsource logistics at 13.72. The study recommended based on the findings that manufacturing companies in Nigeria should focus on core activities where they have competitive advantage over their competitors and outsource the non-core business functions or activities to third party companies who can do it better than they can. The study, however, does not recommend a third-party decision support framework which can help organizations decide whether to outsource or not and can also help organizations in assessing, evaluating, and selecting suitable third-party logistics companies. Also, the study did not include whether third-party logistics outsourcing affects operational cost savings (efficiency) for companies who outsource their logistics compared to companies who keep their logistics in-house. Ndu & Ike-Elechi (2014) studied the speed mail business as third-party logistics providers for firms in various industries in Nigeria. The study findings indicate that inappropriate marketing mix service blending, high taxes on service providers by the government, limited knowledge of the market by 3PLs and regulatory inadequacies in areas such as contract management have made the third party logistics firms providing speed mail services for companies in various industries in Nigeria operationally inadequate hence also affecting the logistics (deliveries of mails, letters and parcels) performance of their clients and therefore affecting overall business performance of their clients. Hence, the study recommended the following:

- That these 3PLs adopt strategies for good service quality determination
- Strategies for management of good service
- Efficiency in service branding which frees up funds for provision of core logistics activities.
- Quality service positioning
- Putting value in the content, context, and structure of message creation

- Creating and sustaining a viable network referral structure

Though the foregoing recommendations might be well useful in improving the services of 3PLs for organization who use 3PLs services for delivery of mails, letters, and parcels, however the study did not recommend a third-party logistics relationship/contract management support tool/framework to help 3PL customers on how to manage their contract/relationship with 3PL companies for more effective, efficient, and productive service. Nurain and Adesunkanmi (2022) carried out research that aimed at determining the impact of the efficiency of logistics outsourcing on the productivity of selected manufacturing companies in Southwestern, Nigeria. The study employed a descriptive survey design and primary data was collected on variables such as haulage, storage and facilities using questionnaire. The study noted that the population comprised of six hundred and twenty (620) senior managers, middle level officers and supervisors who were employed by the selected food manufacturing companies in Oyo, Ogun, and Lagos states of Southwestern, Nigeria. The Sample size of the study comprised two hundred and sixty (260) employees of selected manufacturing companies in Southwestern, Nigeria. The study used Taro Yamane's formula for selection of the sample. Data was analysed using tables, percentages, and regression analysis. The study findings indicates that logistics outsourcing had significant impact on the productivity of manufacturing companies in Southwestern Nigeria leading to the conclusion that logistics outsourcing had significantly enhanced the productivity of manufacturing companies in the Southwestern Nigeria. Though the study's aim is relevant, seeing that a quantitative regression analysis was employed, the population of 620 employees seems insufficient to make generalisation for the entire Southwestern Nigerian which comprises of hundreds of thousands of employees working in manufacturing companies in that region.

Afum et al. (2021) carried out research in Ghana that focused on evaluating how logistics outsourcing is linked to the competitiveness of companies and selected performances. The study focused on Ghana as a case study, but the findings of the research is not generalised

to other emerging countries as evidence from one emerging country is not enough to generalise to other emerging countries. The study findings indicate that outsourcing logistics has significant impact positively on time-based competitiveness, cost-based competitiveness, customer performance and financial performance. The analysis showed that time-based competitiveness and cost-based competitiveness both were found to have a significant positive effect on financial performance, while customer performance does not indicate significant effect on financial performance.

Curea (2016) carried out case study research on the use of third-party logistics companies to gain competitive advantage for organizations with focus on inbound and outbound logistics of companies. The case study research was focused on a company in Texas United states and Mexico. Data was collected through structured questionnaires and the research findings indicated that the use of 3PL companies gives companies an advantage in their inbound and outbound logistics by the fact that products are delivered on time.

2.13 Environmental sustainability practice in logistics outsourcing in selected developing Countries

El Baz and Laguir (2017) carried out case study research on environmental sustainability practices of 3PLs in a developing country context using Moroccan 3PLs as case study. The study aimed at analysing the efforts that are being made by 3PLs to implement green initiatives in a developing country context through a case study of Moroccan 3PLs. The study findings indicate that environmental sustainability adoption is in its infancy stage among Moroccan 3PLs. The study results further indicate that the market coverage of 3PLs can have a positive influence on the adoption of green initiatives; however, the lack of collaboration on the side of partners and clients may hinder it.

Froio and Bezerra (2021) argued that while the topic of environmental sustainability has gained significant attention globally in the research and academic world, not much focus has been made on logistics service providers in emerging economies. Data was collected using semi-structured literature review from major large corporations in Brazil and analysed using NVivo10 software to conduct content analysis. The findings of the research indicates that the surveyed companies have carried out several sustainability initiatives such as reduction of CO2 emissions, customer recognition and energy efficiency. The challenges encountered during the implementation of these sustainable initiatives are high cost, challenges involving customers in the sustainability projects and compliance issues with legislation. The research by Mageto (2022) indicates that sustainability in logistics outsourcing is growing, mostly in developed countries, with less research coming from developing countries. Mageto (2022) further noted that current research on third-party logistics themes and supply chain have been dominated by reverse logistics, circular economy, and green logistics.

Laribi & Dhouib (2015) carried out a similar study as they focused on the barriers to the practice of reverse logistics in Tunisia which were high operating costs, demands from customers, lack of awareness of reverse logistics, lack of top management commitment (hence the need for logistics outsourcing to 3PLs who have the expertise to ensure that reverse logistics is incorporated) and inadequate infrastructure to collect and store products from consumers.

Agrawal and Singh (2021) carried out research aimed at investigating the relationship between logistics outsourcing and the performance of reverse supply chain based on triple-bottom line comprising economic, environmental, and social factors. The study focused on the supply chain of the electronic industry of India. Data was collected using questionnaire from industry experts and partial least square approach of structural equation modelling was used to analyse data. While measurement models were used to determine the fitness of the data to further apply them to partial least square approach of structural equation modelling.

The research findings indicate that outsourcing (including logistics outsourcing) has great influence on the economic, environmental, and social performance of reverse supply chains.

2.14 Supply chain disruptions and the challenges and barriers of practicing third party logistics in selected developing regions

The following developing countries were selected to represent the different levels of developing country contexts in terms of their level of economic and infrastructural development as well as their various geographical representations.

Nel et al. (2018) carried out a study on supply chain disruptions in South Africa from the perspective of South African 3PLs. The study aimed at studying the supply chain disruptions that are encountered by South African third-party logistics service providers and their clients and how these disruptions are managed. The study findings indicate that supply chain disruptions among 3PLs and their clients, and other players in the supply chain are mostly intra and inter organizational related. Hence, the disruptions emanate from within and between 3PLs and their clients and usually not from external factors such as infrastructural deficiencies like road congestion from bad roads or port congestion because of insufficient number of ports as is mostly the case in Nigeria BMI Research a Fitch Group company (2018). The study findings further indicate that 3PLs and their clients in South Africa have shifted their focus from third party or contractual logistics risk management to supply chain disruption management as they argue that this is more effective in managing future disruptions and hence overall supply chain efficiency.

Shaiq and Hassan (2019) carried out a study which focused on assessing the behavioural pattern of the third-party logistics market in Pakistan while comparing it with the demand and supply patterns of the global logistics market. The study further investigated the factors and drivers as well as the barriers impeding the growth of third-party logistics in Pakistan. The

research collected primary data from 180 third party logistics firms in Pakistan using semi-structure questionnaires. The study findings shows that the behaviour of the third-party logistics market in Pakistan lean towards the needs of local businesses and customer demand as well as national business environment and less influenced by the challenges and drivers of the global 3PL market.

Peprah et al. (2019) carried out research that sought to investigate the capacity of 3PL companies to provide their required standard services to their clients and the challenges and barriers that impede the further growth of 3PLs in Sekondi Takoradi Ghana. The study employed descriptive research design. Purposive sampling was used to collect data from management staff of 30 3PL companies. The study findings show that most 3PL companies in the region are SMEs owning minimal number of infrastructure and equipment such as warehouse, forklifts, telescopic handler, and trucks. Traditional transport services are offered, their warehouses do not have software, and most services are offered manually. Also, in terms of transport management, the 3PL companies are not well modernized as they do not use transport management software/systems that can bring innovations with which their operations can be integrated. Hence, there is a lack of advanced technological applications in their operations. Other challenges that impede the growth of 3PLs in Takoradi region of Ghana include scarcity of qualified, skilled labour or experts, poor transportation infrastructure, rising cost of operations, poor timing and punctuality and finding and retaining customers. The study recommended that 3PLs invest in IT infrastructure to move from traditional or conventional methods to innovative and seamless provision of logistical services thereby increasing their opportunities and competitiveness. The study limitations include the limited population of Sekondi Takoradi from which sampling was done hence the study does not reflect the state of 3PL practices and challenges in the entire Ghana. The study also employed descriptive design hence inferences and conclusions cannot be drawn. There were also a few grammatical errors in the study.

Kariko (2012) study results showed that there are challenges that were associated with logistics outsourcing by universities in Nairobi such as loss of control, lack of cooperation from students, resistance to change by stakeholders, cost switching, industrial unrest, and loss of company information to competitors.

Wright et al. (2017) research focused on improving the distribution of vaccines to children in the villages and inner cities in sub-Saharan Africa through an effective transportation system. The study hence recommended that for governments to effectively reach these children in the villages and rural areas they will need to use the expertise of third-party logistics companies for a reliable and sustainable way of transporting the vaccines and other medical commodities in sub-Saharan Africa. The study focused on Mozambique as a case study and the study background was based on the problem that the current practice and resources for transporting these crucial medical supplies in sub-Saharan Africa was inadequate and inefficient. The study further noted that 80% of roads in Mozambique are unpaved and that the ministry of health in Mozambique coordinates the distribution of $10 million worth of vaccines to more than 1,700 rural areas through 11 provinces and 148 districts from two central stores mostly using the expertise of 3PLs with payments as high as $1 million annually to these 3PLs. The study acknowledged the fact that such use of 3PL by the government is rare in sub-Saharan Africa though it has been increasing recently.

Jain et al. (2022) carried out research that aimed at identifying the barriers to the Indian healthcare supply chain using ISM ‘Interpretive Structural Modelling’. Data identifying the barriers was collected for the research through a review of literature, focused group discussion with health care specialists and an assessment of the academic domain of the subject in India. The identified barriers were analysed using ISM. The aim of using ISM was to identify factors that will improve the Indian healthcare supply chain. The findings identified the following barriers: lack of education about healthcare supply chain, inefficient supply chain implementation in hospitals and the entire healthcare sector, lack of coordination between the public and private sector in healthcare supply chain, lack of implementation of

cutting-edge technologies, ineffective human resource coordination and irregular funding to multiple departments and supply chain staffs. The research using ISM aimed at providing knowledge that can be used to overcome these barriers and challenges for the benefit of all the players in the Indian healthcare supply chain such as healthcare product manufacturers, healthcare providers, suppliers, third-party logistics providers and distributors with the overall aim to provide better and timely healthcare services to end-users such as patients and consumers.

Kalinzi (2015) carried out research on the risks associated with logistics outsourcing among Ugandan companies with a critical case study of Mukwano group of companies in Uganda. The study noted the risk of poor service delivery by 3PLs (also identified in the Nigerian case study in the content analysis). The study also noted the issue of trust in terms of truthful declaration of correct costs incurred while rendering service by the 3PL that is risk of inflating costs and/hidden charges (this is also identified in the Nigerian case study in the content analysis). The study also noted issues related to differing cultural approaches between 3PLs and their clients (also identified in the Nigerian case study in the content analysis). The study also noted confidentiality risks where clients' sensitive information may be shared or leaked to other competitors (this is also identified in the Nigerian case study in the content analysis). Other issues identified are possible loss of control/management, opportunistic behaviour of 3PLs, complexities of coordination and reputation risk.

2.15 Third party logistics selection and decision support framework in selected developing country contexts

Pongpanich et al. (2015) carried out a study that investigated the key success factors for selecting consumer to consumer third party logistics provider in Thailand. The study found out that quality of service, short lead time, on time delivery and transport price are the top four key success factors for selecting customer to customer third party logistics providers in Thailand. However, these top four key success factors are the most crucial of 17 sub-factors.

These 17 sub-factors are the third level of a 3-level decision hierarchy model which is based on an extensive literature review and the use of AHP (Analytical Hierarchy Process) in the literature and the pair wise comparison matrix. The three-level decision hierarchy model entails of a first level which is referred to as the solution (key success factors for selecting a consumer to consumer third party logistics firm), the second level is a more specific level with five key factors namely: Price of service, history of company, dissemination of information, customer and business and delivery. “These level two factors are further broken down into 17 sub-factors with each level two factor having a set of factors under it” (Pongpanich et al., 2015, p.254).

Karrapan et al. (2017) carried out research on benchmarking criteria for evaluating/selecting third party logistics providers in South Africa. The research problem is based on the limited evidence that exists of surveys that rank third party logistics providers. Which means that there is a lack of comparative information based on key outsourcing and ranking criteria of major third-party logistics players in South Africa which makes it difficult for companies who may contemplate the use of 3PLs to effectively select and contract a 3PL provider. Hence the purpose of the study was to determine the key selection and ranking criteria required to create an index for evaluating third-party logistics companies in South Africa for the purpose of developing a 3PL benchmarking index and 90% of respondents agreed that a 3PLs index is needed in South Africa. The research used factor analysis method to analyse survey data collected from 103 of the top 500 companies in South Africa who outsource their logistics and operate in sectors that mostly outsource logistics activities. The results of the research indicate that three factors that influence the selection of third-party logistics providers are quality of service, information management and compliance and collaboration. While the top three ranked categories for selecting 3PLs in South Africa are cost of service and price structure, service delivery and relationship with the 3PL firm.

Sharfuddin et al. (2022) argued that outsourcing always affects crucial supply chain functions that concerns flexibility and costs. The study recommended that when making

decisions about third party selection, organizations need to consider critical factors such as cooperation, integration and coordination as these factors are essential in improving overall supply chain performance. The study used a two-faced methodology where first outsourcing decision-making factors are identified from the literature and validated by industry experts and academia. Second, a decision-making trial and evaluation laboratory (DEMATEL) was employed to build a model by understanding the influential strengths and the model was implemented in a courier company in the UAE. The study findings indicate that the most influential factors in the decision making, and selection process of third-party logistics companies are risk mitigation, uncertainty, deficiency of internal resources for a service and developing strategic alliances.

Aigbavboa and Mbohwa (2019) carried out an investigation on the major activities that pharmaceutical companies in Nigeria go through before making the final decision on selecting a third-party logistics provider. The study employed an exploratory mixed method approach with Delphi study. The study was carried out in a sequential manner such that Delphi study preceded a quantitative survey. The findings of the Delphi study indicated that the following activities are ranked among the top three: analysing the present cost of carrying out the proposed logistics function to outsource, visiting 3PL providers' locations and doing adequate due diligence. Furthermore, an exploratory factor analysis (quantitative) of the data showed two main factors that determined the activities namely: "Internal preparedness and Proactive and authentication initiatives" (Aigbavboa and Mbohwa, 2019, p.1). The limitation to this study is that it focused on 3PL selection criteria or pre-selection activities by only pharmaceutical firms in Nigeria and did not study other industries in Nigeria.

Narasimharajan, M. and Venkatesan (2022) researched on the effects of selected factors on evaluating competitive effectiveness among third-party logistics providers in India from a managerial perspective by focusing the various decision-making-aspects (DMA). The study used questionnaire to gather primary data and structural equation modelling was used to

analyse the data in India and the findings were further analysed using a graphical user-interface based partial least square software tool (Smart PLS) to make inference for the study. AHP was used to rank the criteria which were compared to those of the convenience sampling method. The framework is aimed at helping industry experts to conceptualize and learn the strategies that are required for identifying suitable 3PLs. The findings of the research showed that managers attach more importance to time saving when choosing a 3PL. In order words, managers consider a 3PL company that is more responsive and efficient in terms of time and cost as top criteria when selecting a 3PL. The framework also proved that there is a correlation between time saving, cost saving and competitive edge. Though the findings showed that appropriate criteria should be listed for different kinds of firms, the research however provides an experimental support to the correlation between time saving, cost and competitive edge of 3PL providers. This is prioritized by suppliers, manufacturers, distributors, retailers, and customers. Also, using AHP, SEM and the supply chain model the findings of the research showed that inventory management, transportation and delivery, and quality parts are the three top ranked decision-making aspects hence the main contributors to the decision-making process. Hence how 3PLs can save time and cost in these aforementioned aspects of logistics to create a competitive edge is very crucial for the managers in making selection decisions. The other important decision-making aspects which were ranked fourth, fifth and sixth using AHP, SEM and the supply chain model are budgeting, project planning and vendor selection. The research demonstrated the effectiveness of the shortlisted and recommended factors in the SEM and AHP methods but did not validate SEM and AHP methods as this was not part of the aim of the research. Also, the rankings in SEM and AHP were often similar in nature. One weakness of the study however lies on the fact that it did not specify which country or geographical location where primary data was collected though further research on the authors and their affiliate institutions indicates India. Hence, findings made about 3PL selection criteria in India have very limited application in other regions of the world and therefore cannot be generalized.

Akaaboune et al. (2018) carried out research that investigates which criteria are most important to firms in selecting third party logistics companies in emerging countries. The study was focused on Moroccan 3PL market as a case study. The study used SERQUAL (service quality model) and OEM (organizational effectiveness model) as two sets of dimensions to derive performance criteria that have been previously used in judging the performance of third-party logistics companies. A panel of selection experts used these criteria to compare 3PL companies. According to the research findings, 3PL customers in Moroccan market prize financial performance and reputation of 3PLs very highly. In contrast, according to the study, in more mature 3PL markets such as the advanced economies 3PL customers find cost of service and service quality to be most important in selecting third party logistics companies. The table 2.5 below shows how these criteria have been ranked overall using the two models (SERQUAL and OEM):

Table 2.5: Third-party logistics providers selection criteria ranking using SERQUAL and OEM, source: Adil et al. (2018)

Model	Criteria	Weight	Rank
OEM	Financial performance	12.20%	1
OEM	Reputation	12.20%	1
OEM	Cycle time	11.84%	3
SERVQUAL	Empathy	11.75%	4
SERVQUAL	Tangible	10.16%	5
OEM	Productivity	9.23%	6
SERVQUAL	Reliability	8.75%	7
OEM	Customer service	8.43%	8
SERVQUAL	Responsiveness	8.12%	9
SERVQUAL	Assurance	7.31%	10

2.16 Levels of logistics outsourcing in selected developing country regions

India: Gorane and Kant (2016) researched on supply chain practices and its implementation status in India. The study aimed at investigating the current level of implementation of supply chain practices among Indian manufacturing firms. The study classified levels of implementation into three categories namely: high, moderate, and least penetrated supply chain practices. The study found out among other things that the supply chain practice of logistics outsourcing is moderately penetrated among Indian manufacturing firms which means that logistics outsourcing is moderately practiced and used by Indian manufacturing firms which according to literature is like the levels of practice and adoption in most developing countries (Arroyo et al., 2006).

Mexico: Tibbetts (2015) researched on companies that are outsourcing one or more sophisticated logistics functions in Mexico. The study made use of a logistics sophistication index which was developed for a study in Brazil. The index is made up of three independent variables which were analysed to see if they have any significant relationship with the level of sophistication of an outsourced logistics function. The variables are proximity to logistics clusters, the industry segment of the outsourcing company and the size of the company. However, the study was limited in its data sampling size hence there was no conclusive findings however, the study noted that the choices firms make in terms of the level of sophisticated logistics functions that are outsourced are correlated with different factors from country to country. Also, the study recommended that similar studies should be replicated in similar developing regions of the world.

African region: table 2.6 below shows the GDP of some major African economics and the percentage of GDP that are logistics cost and the percentage of that logistics costs that are 3PL revenue. It gives an idea of the level of logistics outsourcing in these regions by the

percentage of logistics costs that are 3PL revenue and the monetary representation. It gives an idea of the level of third-party logistics activities going on in these countries. The figures representing logistics costs and 3PL revenues are in US$ billions. Source is from Armstrong and Associates (2022).

Table 2.6: Logistics costs and 3PL revenues in selected African countries, source: Armstrong & Associates (2022)

Country	2020 GDP	Logistics (GDP %)	2020 Logistics Cost	3PL Revenue %	2020 3PL Revenue
Algeria	144.3	16.5%	23.8	7.9%	1.9
Egypt	361.8	8.3%	30.0	8.6%	2.6
Morocco	113.5	15.0%	17.0	8.5%	1.4
Nigeria	429.4	16.1%	69.1	7.4%	5.1
South Africa	302.1	10.9%	32.9	10.4%	3.4
Sudan	34.4	17.5%	6.0	7.6%	0.5
Africa-others	1,023.9	16.1%	165.3	7.8%	12.9
Africa Total	2,409.5	14.3%	344.2	8.1%	27.9

The table above shows that logistics costs as a percentage of GDP is in double digits across most of the countries represented except Egypt. Also, the table shows that 3PL revenue as a percentage of logistics costs are in single digits for most of the countries represented except South Africa which is in double digits however Egypt's 3PL revenue as a percentage of logistics costs is higher in percentage compared to the country's logistics costs as a percentage of GDP. On the other hand, other countries have much lower 3PL revenues as a percentage of logistics costs compared to their logistics costs as a percentage of GDP. It shows that both Egypt and South Africa relatively have higher 3PL revenues which indicate that both countries have higher levels of 3PL activities indicating that much more organizations may be outsourcing their logistics activities in Egypt and South Africa

compared to other African countries. Nigeria has one of the highest costs as a percentage of GDP at 16.1% and $69.1 billion in value showing that a lot of logistics activities are going on but with little cost efficiency. However, Nigeria has the lowest 3PL revenue as a percentage of logistics costs at 7.4% which shows low usage of the services of 3PL companies compared to the level of logistics activities going on in the country.

Kenya: Macharia et al. (2016) carried out research that investigated the influence of logistics outsourcing on project performance of oil and gas companies in Kenya. The study used questionnaires to gather data from 71 oil and gas players in Kenya and data was analyzed using product moment correlation, descriptive statistics, and regression analysis. The study found out that there was a positive correlation between logistics outsourcing (transportation outsourcing) and oil and gas projects and a weak positive correlation between inventory management outsourcing and oil and gas projects. The foregoing shows that basic logistics services such as transportation and distribution management (DTM) is strongly outsourced while secondary logistics services such as inventory management is not highly outsourced.

Nigeria: Etokudoh et al. (2017) carried out exploratory research on third party logistics outsourcing in the oil and gas industry in Nigeria. The study acknowledged that not much have been researched in logistics outsourcing in emerging countries such as Nigeria which perhaps indicates a limited level of logistics outsourcing in Nigeria compared to more advanced economies such as the UK. The aim of the research was to investigate the feasibility of logistics outsourcing by the international Oil and Gas firms operating in the Nigerian business environment. The study employed an explorative, multi-case, qualitative approach which involved 40 interviewees in three international Oil & Gas companies and their three 3PL companies. The study showed that the surveyed international Oil & Gas companies implement third party logistics unsystematically, partially, bit by bit and therefore need to scale up their current capabilities to effectively integrate logistics outsourcing. The research further confirms that logistics outsourcing is achievable in the Nigerian Oil & Gas

sector but requires synergy and symbiosis between the Oil companies and their local 3PL providers. Adesunkanmi et al. (2022) carried out research that investigated the effect of third-party logistics outsourcing on the operational performance of manufacturing companies into fast moving consumer goods (FMCG) in Southwestern Nigeria. The study findings indicate that logistics outsourcing has significant positive impact on the operational performance of companies investigated. It also shows that third-party logistics is well used among manufacturing FMCGs in Southwestern Nigeria.

2.17 Comparison of third-party logistics practice between selected developed and developing regions of the world

Arroyo et al. (2006) researched on the status of third-party logistics practice in Mexico with comparison with reports from USA and Europe with the aim to find out the feasibility of third-party logistics as a global uniform strategy for organizations. The study used survey method to collect data from firms in the central parts of Mexico and compared the results with data from literature on third party logistics practice in the USA and Europe. The study findings indicate that though logistics outsourcing is a common practice among large firms in Mexico, it is however a low-profile practice. The study found out only a third of surveyed large companies in Mexico outsource more than three logistics functions and these functions are usually supportive and operational functions. The study further noted that firms in Europe and USA use third party logistics higher than Mexican firms as these firms in the USA and Europe use 3PL services for more tactical (strategic) and integrated function while also focusing on cost reduction but firms in Mexico outsource more core functions. The study further noted that uniform global 3PL strategies should be considered with care as what may work in Mexico may not work in Europe and United States of America.

Akaaboune et al. (2018) noted in their study on 3PL selection criteria in emerging markets with focus on Morocco, that 3PLs customers from advanced countries such as Germany, France, Denmark, Switzerland, Spain, and Portugal are more concerned about cost (i.e.,

cost of service and reduction in logistics costs) and quality of service. On the other hand, 3PL customers in Morocco are more concerned about the financial performance and the reputation of 3PL firms for selection of 3PLs. Other important criteria are cycle time and empathy while criteria such as customer service, responsiveness and assurance were in the last three bottoms of 10 criteria respectively.

Lieb and Lieb (2010) carried out research which sought to investigate the extent to which large third-party logistics companies are committed to environmental sustainability goals. Survey data was collected from 40 large 3PL companies in North America, Europe, and Asia-Pacific region. The study findings show that nearly all the companies that was surveyed in matured 3PL markets in North America, Europe and Asia-Pacific have made significant commitments to environmental sustainability goals in the past several years and that a broad range of similar projects have been launched with significant positives impact on these companies. The study findings further indicate that 3PL customers have also demonstrated increased interest in the environmental sustainability capabilities of 3PLs in these regions. This survey was carried out during the 2008-2009 economic recessions which did not affect the commitment of 3PLs to environmental sustainability in these regions; however, in emerging markets 3PL customers did not demonstrate increased interest in the environmental sustainability capabilities of 3PLs (Agrawal and Singh, 2021).

Asthana and Dwivedi (2020) carried out research that focused on the performance measurements for third-party logistics companies from the perspectives of both the users and the providers. The study was carried out India but compared the results with findings from reports on third-party logistics performance in developed countries. The study noted that it has become more important for 3PL service providers and service users in India to adjust future logistics strategies and operations to be confirmed to a wider ecosystem involving digital infrastructure which includes Internet of Things (IoT), big data, localized systems of value creation, which most likely will result in distributed manufacturing paradigm.

2.18 Reasons for the difference in levels of logistics outsourcing and the impact of remaining the same

According to the Global third-party logistics industry report 2020 by ReportLinker there are significant global growth projections in 2020 for the third-party logistics market between 2020 and 2026. The total global growth was estimated at $495.6 billion at the end of 2020 which was driven mainly by the DTM (Distribution and Transport Management) segment as its global market value is expected to reach $577 billion by 2025 (ReportLinker, 2020). The report shows that the USA, China, Germany, and Japan are the four major markets with the most significant growth projections. The US third party logistics market is expected to grow by 6.3%, while China is expected to grow by 9.2%. Furthermore, Germany's DTM (distribution and transportation management) is expected to add $14.2 billion to global DTM growth in the next few years up to 2025, while the rest of Europe is expected to add $21.4 billion to global DTM growth. Furthermore, Japan's DTM market is expected to reach $17.7 billion by 2025 (ReportLinker, 2020). The foregoing indicates that distribution and transport management is a major area of logistics outsourcing globally (Solakivi et al. 2011). While distribution and transport management contributes majorly to global third party logistics activities, the developed economies have more complex and integrated third party logistics practice where third party logistics companies provides integrated and value added service therefore going beyond the provision of distribution and transport management services to warehouse management, inventory management, order management and processing, supply chain simulation and modelling, handling and packaging, customer service, demand management and engineering services such as warehouse build and/or design; high technology equipment installation and specialist equipment (Arroyo et al., 2006; Global Data Plc, 2022; Ezenwa et al., 2018).

Arroyo et al. (2006) noted that companies in developed regions such as Europe and America outsource integrated logistics functions focusing on more tactical and strategic functions and cost reduction while companies in Mexico focus on core or primary logistics functions such as transportation and distribution (Ezenwa et al., 2018; Liberto, 2015). The foregoing indicates that logistics outsourcing is higher in developed countries because majority companies who outsource in developed economies outsource more sophisticated, complex, and integrated functions in a strategic and tactical manner to reduce cost and achieve overall long-term organizational goals and objectives (Jain et al., 2022; Curea, 2016; Cichosz et al. 2017;). Also, literature show that third party logistics providers in developed economies are more of strategic alliance partners rather than only contract service providers which ultimately aims to cut costs, share risks and achieve growth, efficiency and competitive advantage for both the 3PLs and their strategic alliance partner clients (Buyukozkan et al., 2007; Wang and Regan, 2002; Konig and Spinler, 2016; Cichosz et al., 2017; Nunez-Carballosa and Guitart-Tarres, 2011).

It therefore suggests that there are opportunities for growth of logistics outsourcing in more integrated logistics functions, engineering services such as warehouse design and build, specialist equipment, high technological installation, process improvement, order management, demand management, customer service and inventory management.

2.19 Importance of using an effective decision support framework and the risks of its absence

König and Spinler (2016) carried out research on the effect of logistics on the supply chain vulnerability of shippers using a conceptual risk management framework. The study aimed at presenting a conceptual risk management framework with which to show the effect of logistics outsourcing on the supply chain vulnerability of shippers. The research employed a meta-synthesis of literature review and developed a conceptual risk management framework

based on the findings from the literature review. The findings of the research indicate that logistics outsourcing is increasingly been used by shippers. However, the specific areas of supply vulnerability and supply chain risk management are rarely covered in research with limited practice. The findings further show that the effect of logistics outsourcing on the supply chain vulnerability of shippers can be ambiguous, and its specific impact is influenced by other internal and external factors. The study recommended that third party logistics providers streamline their services specifically to each client such that each are better prepared for possible future supply chain disruptions. Furthermore, the research recommended for further research to be carried out in the seemingly nascent topic as literature that directly deals with logistics outsourcing and supply chain vulnerability and its risk management framework is very limited. Hence, the framework was developed from insights compiled from distinct research areas. The study noted that the framework enables shippers to actively use logistics outsourcing to reduce their supply chain vulnerability and revise their risk management strategy.

Holter et al. (2008) carried out research about a framework for purchasing transport services in Small-to-Medium-Enterprises (SMEs). The research is aimed at presenting a framework that will enable SMEs to improve their relationship with logistics service providers such as third-party logistics companies and thereby enhance their competitive advantage and profitability. The research indicates that the lack of an effective framework for purchasing transport services from logistics service providers makes SMEs to lack the purchasing power which may often cause them to be on the receiving side of order instead of making the orders. The foregoing is identified as a research problem. The research used a single case study method where a knowledge transfer partnership research project was carried out between a focal company and a university using action research to develop and implement the framework. While this research focused on developing a framework for purchasing transport services, the framework does not cover other aspects of logistics activities such as warehousing and inventory management, order processing, customer service, and

packaging and handling. The findings of the research indicates that the framework using several tools for purchasing transport services and improving transport performance benefited both the focal company and the logistics service provider and the relationship between the focal company and the logistics service provider was improved through power balance. The findings of the research are limited in its generalizability as it is a single case study, and the framework was not tested in other firms or sectors. However, the research denotes the importance of companies using a suitable framework for purchasing or outsourcing logistics services such as transport services.

Buyukozkan et al. (2007) carried out research that developed a decision support framework for selecting strategic alliance partner in the logistics value chain. Companies aim at selecting a suitable strategic alliance partner in the logistics value chain to better serve their customers and achieve business excellence. The study noted that the selection of a suitable strategic alliance partner in the logistics value chain can be associated with uncertainty and complexity. Hence, the research proposed a multi-criteria decision-making (MCDM) approach to effectively evaluate and select strategic alliance partners. The study did this by identifying the strategic main and sub-criteria of alliance partner selection that are most important to companies then a fuzzy Analytical Hierarchy Process (AHP) was applied to calculate the criteria weights. Also, because subjective considerations are relevant to the evaluation and selection of suitable logistics partner such as a third-party logistics company, a fuzzy logic approach is adopted for this reason. Hence, the study further employed fuzzy logic in Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) for concluding the logistics partner ranking results. The study also used a case study to demonstrate the potentialities of the methodology. The study used two groups of evaluation criteria in the evaluation/selection criteria. The first group focuses on the strategic aspects of the logistics partner such as similar values and goals, similar size, being financially stable, having similar organizational culture, successful track record and fitness to develop a sustainable relationship. The study used the second group of evaluation criteria to measure

important areas of the logistics partner's business in four main aspects: partner's technical expertise, partner's overall organizational performance, partner's quality, and managerial experience. The study noted that one of the benefits of such strategic partnership alliance is risk sharing. It further illustrates the importance of a decision support framework for evaluating and selecting third party logistic companies where applicable for organizations who may be interested in using the services of a 3PL. The study also highlights the risks of not having an effective decision support framework for evaluation and selection of a logistics partner such as a 3PL such as the uncertainty and complexity associated with finding the right logistics partner suitable for a sustainable relationship.

Ejem et al. (2021) carried out research that focused on solving the evaluation and selection of 3PLs by using multicriteria method. The research used stepwise weight assessment ratio (SWARA) and Technique for order preferences by similarity to ideal solution (TOPSIS) to come up with a framework for evaluating and selecting a suitable 3PL. The following criteria were basis on which the evaluation was established: Cost, Service level, Financial Capability, Reputation and Long-term relationship. Five companies in Nigeria were studied, and data was collected via oral interviews with managers and key decision makers in the companies that participated. SWARA was used to determine the relative weights of the criteria while TOPSIS was applied to the weights developed by using SWARA and to the performance of the selected 3PL providers. These weights were ranked using TOPSIS and after analysis, the study identified the supplier 2 as the best 3PL service provider and supplier 5 as the worst 3PL service provider. The significance of the study lies on the importance of using techniques such as SWARA which minimises variations in weights among criteria, where infrastructural and business factors such as distance from main roads, ports, airports, suppliers, and warehouse hold significant importance in the decision-making process of selecting a suitable 3PL provider.

2.20 The importance of logistics outsourcing and the risks and/or impact of keeping logistics in-house

Gotzamani et al. (2010) carried out research in Greece that investigated the logistics outsourcing dilemma which is based on the decision whether to outsource logistics and whether to choose a third-party logistics provider based on quality management and financial performance. A survey instrument was applied to a sample of 66 manufacturing and 3PL companies. Statistical inference test and cluster analysis were employed to test the research hypotheses and the research findings indicate that third party logistics providers are ahead of manufacturing companies operating logistics in terms of quality implementations and improvement issues. The study findings suggest that careful implementation of logistics outsourcing activities can have positive impact in terms of quality improvement and performance of manufacturing companies. However, the study findings are limited as they were focused in one country namely Greece. Further investigations are required to establish similar suggestions in other regions, especially developing country regions and to find out the impact and/or any risks of not adopting the same strategy.

Doratiotto et al. (2023) carried out research that aimed at evaluating the factors that influence logistics outsourcing, which includes how logistics outsourcing impacts on measuring companies' logistics performance. The study collected data from 129 managers of companies in the industrial sector in Brazil. Structural equation modelling was used to understand what criteria are relevant in measuring the logistics performance of companies who use 3PLs. The interaction between the constructs indicates that collaboration and process characteristics are the most determinant factors that influence the logistics performance of companies who outsource to 3PLs. The foregoing also highlights the importance of managing 3PL contractors correctly; and that financial factor contributes to the decisions around logistics outsourcing.

Wang and Regan (2002) noted that logistics outsourcing has increasingly become an effective way to spread risk and that 60% of fortune 500 firms have at least one contract with a third-party logistics provider. The study noted that the benefits of logistics outsourcing include elimination or reduction in infrastructure investment, access to world class processes, technology or service, reduction in operating costs, access to resources not readily available at own organization and risk sharing (Olubiyo (2022). It is obvious then that risk sharing is a major reason for logistics outsourcing which implies that companies who do not outsource bear all the risks associated with logistics activities (Onyebueke et al., 2019). Adebambo et al., (2015) noted that logistics outsourcing enables companies to reduce investments on capital, hence reducing financial risks. Olubiyo (2022) carried out research which investigated the impact of logistics outsourcing on clothing manufacturing SMEs. The research findings indicates that the major reasons for third-party logistics outsourcing among clothing manufacturing SMEs in Nigeria according to the ranking by the 80 respondents are ability to manage a function that is outside of the control of the 3PL client, better flexibility of operations, new and emerging technology capabilities, ability to lessen delivery time, access to resources and market that are not obtainable in-house, risk reduction, and reduction in operating and control costs.

2.21 Papers that acknowledge dearth of research in third party logistics in Nigeria

Table 2.7 below shows list of recent academic research papers that were carried out in Nigeria that noted that there is a dearth of research on third party logistics practice in Nigeria which means that further investigations and research is required in the topic area in Nigeria. The foregoing justifies the need for more research and investigations to be done in the topic area for process and performance improvement and generally for increased knowledge, guidance, and recommendation in the topic area.

Table 2.7: Academic research papers in Nigeria noting the dearth of research on third party logistics practice in Nigeria.

No.	Author(s)	Paper title	Comments on 3PL research
1	Etokudoh et al., (2017)	Third Party Logistics Outsourcing: An Exploratory Study of the Oil and Gas Industry in Nigeria	Gaps exists in literature about the benefits and challenges of third-party logistics services in Nigeria
2	Onyebueke et al., (2019)	Overcoming the Challenges of Logistics Outsourcing in Selected Oil and Gas Companies in Rivers State	Logistics outsourcing in Nigeria is evolving
3	Ezenwa et al. (2018)	Investigating ICT diffusion dynamics among SMEs third-party logistics providers in Nigeria: an exploratory mixed-method study	Noted that there is very little information about the rapid spread of ICT among SME third party logistics companies especially in developing countries such as Nigeria. Hence, authors and scholars are unable to ascertain whether there has been a diffusion of information

			and communications technology among third party logistics companies in Nigeria especially SME third party logistics companies.

2.22 Papers that acknowledge that third party logistics is less researched in developing countries

Also, table 2.8 below shows a list of academic research papers that noted that logistics outsourcing is more researched in developed countries compared to developing countries. The aim is to demonstrate that more research into third party logistics practice is required in developing countries than it is in developed countries.

Table 2.8: Academic research papers that acknowledged that logistics outsourcing is more researched in developed countries compared to developing countries

No	Author/date	Paper title	Comments on 3PL research
1	Dapiran et al. (1996)	Third party logistics services usage by large Australian firms.	Noted that third party logistics is more researched in advanced economies
2	Lieb et al. (1993)	Third-party logistics: A comparison of experienced American and European manufacturers	Noted that third party logistics is less researched in developing countries
3	Lieb and Miller (2002)	The use of third-party logistics services by large	Acknowledged that third party logistics is under

		US manufacturers, the 2000 survey	researched in developing countries compared to developed countries
4	Sink et al. (1996)	Buyer observations of the US third-party logistics market	Acknowledged that third party logistics is well researched in developed economies compared to developing countries
5	Solakivi et al. (2011)	Logistics outsourcing and company performance of SMEs: Evidence from 223 firms operating in Finland	Noted the proliferation of third-party logistics research in developed economies compared to developing economies
6	Arroyo et al. (2006)	A survey of third-party logistics in Mexico and a comparison with reports on Europe and USA	Noted that third party logistics is less researched and less practiced in developing countries compared to developed countries
7	Tian et al. (2010)	Third-party logistics provider customer orientation and customer firm logistics improvement in China	Noted that there is a dearth of third-party logistics research in developing countries compared to developed countries though there is rapid growth of third-party logistics in China

8	Mageto (2022)	Current and Future Trends of Information Technology and Sustainability in Logistics Outsourcing	The study noted that sustainability in logistics outsourcing is growing but mostly in developed countries, with less research coming from developing countries.
9	Etokudoh et al., (2017)	Third Party Logistics Outsourcing: An Exploratory Study of the Oil and Gas Industry in Nigeria	Gaps exists in literature about the benefits and challenges of third-party logistics services in Nigeria and similar developing countries
10	Onyebueke et al., (2019)	Overcoming the Challenges of Logistics Outsourcing in Selected Oil and Gas Companies in Rivers State	Logistics outsourcing is under researched in developing countries such as Nigeria
11	Adebambo et al., (2015)	Impact of Logistics Outsourcing Services on Company Transport costs of selected Manufacturing Companies in Southwestern Nigeria	This study reviewed literatures on the concept of third-party logistics in developed countries setting the practice and research in these developed regions as a standard
12	Charles and Ochieng (2023)	Strategic outsourcing and firm performance: a review of literature	Carried out a systematic literature review of the impact of strategic

			outsourcing on firm performance and noted that there is limited research on influence of strategic outsourcing on firm performance in developing countries
13	Oyedijo et al. (2022)	Restraining forces and drivers of supply chain collaboration: evidence from an emerging market	Acknowledged that many studies on supply chain management have wholly focussed on developed countries, often neglecting emerging markets such as Nigeria in the discourse.

2.23 Sector specific research on third party logistics in Nigeria

Table 2.9 below lists academic research papers that are focused on the practice of third-party logistics in one sector or industry in Nigeria which leaves a gap for research on third party logistics practice that is not sector specific. It leaves a gap in literature for research on third party logistics practice in Nigeria that covers several major sectors that are reliant on logistical service or that are associated with high level of logistics activities.

Table 2.9: Sector specific research on third-party logistics in Nigeria.

No.	Author(s)	Paper title	Sector
1	Etokudoh et al., (2017)	Third Party Logistics Outsourcing: An Exploratory Study of the Oil and Gas Industry in Nigeria	Oil and Gas sector

2	Onyebueke et al., (2019)	Overcoming the Challenges of Logistics Outsourcing in Selected Oil and Gas Companies in Rivers State Nigeria	Oil and Gas sector
3	Okoroafor and Nwankwo (2021)	The Challenges of Third-party Logistics in Nigerian Pharmaceutical Industry	Pharmaceutical industry (healthcare sector)
4	Adebambo et al., (2015)	Impact of Logistics Outsourcing Services on Company Transport costs of selected Manufacturing Companies in Southwestern Nigeria	Manufacturing sector
5	Thompson et al. (2019)	An Exploratory Study of the Strategic use of 3PL for Cost reduction and Customer satisfaction in the Oil and Gas Industry: Nigerian Firms' Experience	Oil and Gas sector
6	El Sakty and Okorie (2021)	Impact of Logistics Outsourcing on the Oil and Gas Industry Performance: A case study of the Nigerian Market	Oil and Gas sector
7	Mac-Kingsley and Ihunwo, (2018)	Logistics Outsourcing and Success of Physical Distribution Management: A Study of Clearing and Forwarding Companies in Rivers State Nigeria	Sea Ports

8	Ndu and Ike-Elechi (2014)	Third Party Logistics Service Marketing and Economic Development (Study of the Speed Mail Business in Nigeria)	Express cargo (speed mail industry)
9	Ezenwa et al. (2018)	Investigating ICT diffusion dynamics among SMEs third-party logistics providers in Nigeria: an exploratory mixed-method study	Information and communications technology
10	Horsfall et al. (2018)	Comparative study of logistics outsourcing and in-house services on customer satisfaction among Nigerian manufacturing companies	Manufacturing
11	Ibiama et al. (2024)	Evaluation of Logistics Outsourcing Strategies in the Oil and Gas Companies in Niger Delta Region	Oil and Gas sector
12	Adesunkanmi et al. (2022)	Effect of Logistics Outsourcing on Operational Performance of the Selected Manufacturing Companies in Southwestern Nigeria	Manufacturing FMCG
13	Olubiyo (2022)	Investigating the impact of third-party logistics outsourcing on the performance of clothing manufacturing SMES in Nigeria.	Textile manufacturing SMEs
14	Aigbavboa and Mbohwa (2019)	Going the extra mile: Vital third-party logistics service providers'	Pharmaceutical industry

		pre-selection activities by pharmaceutical organizations	
15	Ewuzie et al. (2023)	Stimulators of third-party logistics performance of supply chains in the Nigerian manufacturing industry	Manufacturing industry
16	Oyedijo et al. (2022)	Restraining forces and drivers of supply chain collaboration: evidence from an emerging market	Food and beverage
17	Ezenwa et al. (2021)	Development of strategies to improve information communication technology diffusion in Nigeria's logistics and transport industry: Adaptation of structure-process-outcome model	Information and communications technology
18	Aigbavboa and Mbohwa (2020)	The murky waters of outsourcing: critical risks factors of outsourcing pharmaceutical outbound value chains	Pharmaceutical industry

2.24 Summary of key themes from the review of literature

This section outlines the key themes from the review of the literature which has informed the data collection process. The key themes from the review of the literature have been used to develop the questionnaire and the interview questions. Quantitative data were first collected using questionnaire while qualitative data were collected for further in-depth investigation using semi-structured interviews. Content analysis was used to provide data for the third-

party decision support framework specifically on the potential risks and costs of carrying out each logistics activity. The results of the data analysis from both the quantitative and qualitative data were used to inform the weighted ratio in the decision support framework which is aimed at determining if a particular logistics activity should be outsourced or not.

Table 2.10: summary of key themes from literature review

No	Theme	Literature review section	Summary of Questions and type of data collection method
1.	The reasons for logistics outsourcing	Sections 2.7 and 2.20	Likert scale questionnaire and semi-structured interviews: this theme informed the questions that were asked the participants using semi-structured interviews on why their organisations outsource logistics following questions on the level of outsourcing of each logistics activity using Likert scale questionnaire so as to better understand each organisation's logistics outsourcing decisions.
2.	Logistics outsourcing and firm performance	Sections 2.5, 2.9 and 2.13	Likert scale questionnaire: this theme informed questions on the impact of third-party logistics on overall firm performance and specifically on areas such as cost efficiency, and whether the use of modern technology by third-party logistics companies has influenced operational efficiency and customer satisfaction.

3.	Problems and challenges associated with third-party logistics	Sections 2.10 and 2.15	Content analysis: this theme informed the content analysis key word search with the aim to explore and understand the challenges associated with the practice of logistics outsourcing in Nigeria and to use this method to obtain secondary data that will be used to inform the potential risks and costs associated with carrying out each logistics activity in the decision support framework.
4.	Third-party logistics decision support framework	Sections 2.11, 2.16 and 2.19	Likert scale questionnaire: the review of literature on this theme indicates that scholars have focused on third-party decision support frameworks that is aimed at assisting organisations select the most suitable 3PL company. It therefore indicates a gap and provides justification for the development of a third-party logistics decision framework that is aimed at assisting organisations make informed 3PL pre-selection decisions. The theme also informed the questions that were asked to experts to collect expert opinion on the relevance and benefits of a third-party decision support framework that can be used in assisting organisations who may contemplate the use of 3PLs to decide

			whether to outsource or to keep a particular logistics activity in-house.
5	Logistics outsourcing usage	Sections 2.12, 2.17 and 2.18	Likert scale questionnaire: this theme informed the questions that were used to expert on the level of outsourcing of each logistics activity.

3.0 INDUSTRY ANALYSIS CHAPTER

This chapter investigates and analyses the Nigerian third-party logistics industry while providing examples of major industry players. The market trends, growth projections, market segmentation and major players are discussed.

The Nigeria 3PL market is segmented by type (domestic transportation management, international transportation management, and value-added warehousing and distribution) and by end-users (manufacturing and automotive, oil and gas and chemicals, distributive trade, pharma and healthcare, construction, and others) (Mordor Intelligence, 2023).

3.1 Key market development influencing the Nigerian 3PL market

Intra-Regional Trade Increase: Intra-Africa trade is only 15% of Africa's total trade, compared to 80% in Asia. African Continental Free Trade Area (AFCFTA) is expected to significantly boost intra-regional trade, enhancing the continent's economic integration. This is projected to contribute to the growth of the Nigerian 3PL market. The agreement aims to increase production of essentials and value-added products leading to economic growth and diversification. This will lead to structural transformation, reducing dependency on labour forces and increasing investments. Therefore, leading to economic diversification. On the premise of the foregoing therefore, a potential increase by up to 9%, adding USD 571 billion to the economy. Nearly 18 million new jobs are projected with a significant portion being higher-paying and higher quality, benefiting women the most. Furthermore, the agreement could help up to 50 million people escape extreme poverty by 2035 (Mordor Intelligence, 2023).

The agreement is further expected to boost foreign direct Investment (FDI) and exports. African exports are expected to be up by 32% by 2035. Also, the agreement is expected to bring significant increases in intra-African exports, particularly in manufactured goods, with notable growth in countries like Tunisia, Cameroon, Ghana, Tanzania, and South Africa. The

foregoing has some implications for Nigeria's 3PL Market. The increased trade volume and rise in intra-African trade will likely increase demand for logistics services to handle the higher volume of goods being transported across borders. Also, enhanced economic activity and FDI could lead to more investments in logistics infrastructure and services. Furthermore, Improved production capabilities and economic diversification will require efficient logistics solutions to maintain competitiveness in the global market. In addition, the logistics sector could see job growth as demand for logistics services increases, contributing to overall employment growth in the region (Mordor Intelligence, 2023).

Overall, the AFCFTA presents a transformative opportunity for the Nigerian 3PL market, driving growth through increased trade, investment, and economic diversification.

Make in Nigeria for Export (MINE) Initiative: the objective of MINE is to develop world-class Special Economic Zones (SEZs) to boost the manufacturing of "Made in Nigeria" goods for export. The goal of the foregoing is to Increase the manufacturing sector's contribution to GDP to about 20%. The MINE also aims to create 1.5 million new direct jobs. MINE also aims to generate over USD 30 billion yearly by 2025. The initiative involves collaboration between the Federal Executive Council (FEC), the Economic Management Team (EMT), and Project MINE's Steering Committee, using a sustainable Public-Private Partnership (PPP) model. Manufacturing Sector Performance (Q1 2022) has seen growth attributable to MINE. This includes real terms manufacturing growth of 5.89% year-on-year, up from 2.28% in the previous quarter. Contribution to nominal GDP growth rate of 11.72% year-on-year, down from 32.10% in the same quarter of 2021. Also, manufacturing sector's contribution to GDP of 10.20% in real terms, up from 9.93% in Q1 2021 but down from 8.46% in Q4 2021 (Mordor Intelligence, 2023).

The manufacturing sector in Nigeria comprises of cement, food, drinks, tobacco, textiles, clothing, footwear, wood products, paper goods, chemicals, pharmaceuticals, non-metallic products, plastics, rubber goods, electrical and electronic goods, basic metals, iron and

steel, motor vehicles, and other goods. The sector showed significant growth in real terms, indicating increased production and economic activity. However, the nominal GDP growth rate's decline suggests that while production increased, the value of goods produced may have faced pricing pressures or inflationary effects.

Overall, the MINE initiative and the manufacturing sector's performance in Q1 2022 reflect Nigeria's efforts to enhance its industrial base and economic resilience. If successful, these efforts could significantly boost the country's economic growth and global trade presence and ultimately boost growth in the Nigerian logistics industry.

3.2 Nigeria Third-Party Logistics (3PL) Industry Overview

The Nigeria Third-Party Logistics (3PL) Market is highly fragmented with many local and international players such as FedEx, UPS, GMT Logistics, Maersk, DHL International GmbH, Creseada International Limited, Bollore Transport and Logistics, MSC (Mediterranean Shipping Company) and many more others as its key players. With the analysis above as well as the vast population and regulatory changes in the economy, the country expects significant economic growth in the coming years which will have an impact on the logistics industry. Hence, companies globally are investing in developing their logistics business in the country to grasp the opportunity (Mordor Intelligence, 2023). For example, in June 2022, following an exclusive negotiations announced on 20 December 2021 and the favourable opinions issued by each of the consulted employee representative bodies, the Bollore Group signed an agreement with the MSC Group for the sale of 100% Bolloré Africa Logistics, comprising Bollore Group's transport and logistics activities in Africa, on the basis of an enterprise value, net of minority interests, of 5.7 billion euros (6.07 USD billion) (Mordor Intelligence, 2023). This will mean increased logistical investments by Bollore Africa Logistics in major African economies such as Nigeria being the third largest economy in Africa.

Also, in January 2022, Kuehne+Nagel, expanded its network of African offices, which are managed and supported by a control tower in Durban, South Africa. The regional control tower acts as a single point of contact for an integrated network that spans the continent, allowing for complete visibility, including remote locations, while upholding Kuehne+Nagel's global service standards and monitoring data quality. This expansion meant that Kuehne+Nagel's will be operating significantly in 18 African countries including Nigeria (Mordor Intelligence, 2023).

The Nigerian 3PL market is fragmented and highly competitive at the lower end of the market without dominant players in the lower. However, at the upper end of the market, it is dominated by five major players. The key players in the entire market are listed below but this report further provides information on the operations of the five key players and a short case study on a major disruptor in the industry with a strong presence in Africa including Nigeria. Twelve key players are listed below based on Mordor Intelligence report (Mordor Intelligence, 2023).

- Maersk Line
- DHL International GmbH.
- Creseada International Limited
- Bollore Transport and Logistics
- MSC (Mediterranean Shipping Company)
- ABC Transport
- LOGISTIQ XPEDITORS LIMITED
- REDOXCORP SHIPPING & LOGISTICS LIMITED
- GWX
- Redline Logistics
- AGS Movers Lagos
- UPS (United Postal Services)

Maersk

Maersk, a global leader in shipping and logistics, has a robust presence in Nigeria, offering a variety of services to meet diverse shipping needs. They offer a range of services including standard, refrigerated, and oversized cargo shipping. Maersk operates from major ports such as Lagos, Kano, and Port Harcourt, providing regular connections to their global ocean fleet. They also offer local solutions, payment options, and a comprehensive guide to shipping to and from Nigeria. Maersk handles a wide range of standard cargo, ensuring efficient and reliable transportation. They provide specialized refrigerated containers to transport perishable goods, maintaining optimal temperatures throughout the journey. For large and heavy items, Maersk offers tailored solutions to ensure safe and secure shipping (Maersk, 2024).

The company's operational ports include Lagos port where the company's main office is located at 2-4 Kazuma Street, Apapa, Lagos. This port is crucial for both import and export activities. The company also operates from Kano, facilitating connections to the northern regions of Nigeria. They also operate at the Port Harcourt port. This port serves the southeastern part of Nigeria, playing a vital role in the region's trade. The company Maersk provides regular connections from these major Nigerian ports to their extensive global ocean fleet, ensuring seamless international trade (Maersk, 2024).

Furthermore, Maersk offers various local solutions tailored to the Nigerian market, including customs clearance, warehousing, and inland transportation. They also provide flexible payment options to accommodate different customer needs, making the shipping process more accessible.

Recent investments: In April 2024, Maersk announced a $600 million investment in Nigeria's seaport infrastructure. This investment aims to modernize and automate ports, reduce congestion, and improve overall efficiency.

Digital Innovations: Maersk has introduced a new digital booking solution that allows customers to confirm cargo bookings instantly. This system provides greater visibility of sailing options, available vessel space, and a choice of value-added services especially as such innovations in logistics are still emerging in Nigeria. Maersk's digital solutions include a comprehensive guide to shipping to and from Nigeria which includes detailed information on routes, import and export procedures, local charges, and more (Maersk, 2024)

DHL International GmbH

DHL is a global leader in logistics and supply chain management. In Nigeria, DHL provides a wide range of services including express shipping, freight transport, supply chain management, cold chain logistics and e-commerce logistics solutions. DHL's robust presence in Nigeria is marked by multiple offices and facilities across the country, ensuring efficient and reliable service for both domestic and international shipments. DHL operates numerous offices and facilities across Nigeria, including major cities like Lagos, Abuja, and Port Harcourt. These locations serve as hubs for their extensive logistics network. DHL has robust transportation networks and extensive transportation infrastructure that guarantees the timely and reliable delivery of goods, maintaining their quality and extending their shelf life (DHL, 2024).

Key Services Provided by DHL in Nigeria

Express Shipping: DHL Express offers fast and reliable delivery services for urgent documents and parcels. This service is crucial for businesses and individuals needing timely deliveries.

Freight Transport: DHL Global Forwarding provides comprehensive freight transport solutions, including air, ocean, and road freight. This service supports the movement of goods across borders and within Nigeria, facilitating international trade.

Supply Chain Management: DHL Supply Chain offers end-to-end supply chain solutions, including warehousing, distribution, and value-added services. This helps businesses optimize their supply chains and improve efficiency.

E-commerce Logistics: DHL eCommerce Solutions supports online retailers with tailored logistics solutions, including order fulfilment, inventory management, and last-mile delivery. This service is vital for the growing e-commerce market in Nigeria.

Cold Chain Logistics: DHL's cold chain solutions ensure the preservation of perishable goods from farm to table, significantly reducing spoilage and waste. This is particularly important for Nigeria's agricultural sector.

Impact on Nigeria's Economy

Employment: DHL employs a significant number of people in Nigeria, contributing to job creation and economic growth. Globally, DHL employs over 600,000 people in more than 220 countries and territories.

Support for SMEs: DHL provides tailored logistics solutions for small and medium-sized enterprises (SMEs), helping them navigate supply chain challenges and expand their businesses.

Sustainability Initiatives: DHL is committed to sustainable business practices, striving for a balance between ecology, economy, and society. This includes initiatives to reduce carbon emissions and promote green logistics.

Overall, DHL's comprehensive services and strong presence in Nigeria make it a pivotal player in the country's logistics and supply chain landscape. Whether it's supporting local businesses or ensuring timely deliveries, DHL continues to drive efficiency and reliability in Nigeria's logistics sector (DHL, 2024).

Creseada International Limited

Creseada International Limited has been providing supply chain services in Nigeria for over 30 years. They have been a cornerstone in Nigeria's logistics and supply chain sector for over 30 years. They offer a comprehensive suite of logistics solutions, including freight forwarding, warehousing, and transport logistics. Known for their multi-modal transportation services by air, ocean, and road, Creseada caters to both global import and export needs. The company operates multiple offices and facilities across Nigeria, including their corporate head office in Lagos. These locations serve as strategic hubs for their logistics operations. Creseada leverages advanced technology to enhance their logistics services. This includes the use of real-time tracking systems, automated inventory management, and data analytics to optimize supply chain efficiency. Creseada contributes significantly to job creation in Nigeria, employing a large workforce across their various operations. This supports local communities and drives economic growth. The company provides tailored logistics solutions for small and medium-sized enterprises (SMEs), helping them overcome supply chain challenges and expand their market reach. Creseada is committed to sustainable business practices, including initiatives to reduce carbon emissions and promote eco-friendly logistics solutions (Creseada, 2024).

Key Services Provided by Creseada International Limited

Freight Forwarding: Creseada provides efficient freight forwarding services, ensuring the smooth movement of goods across international borders. Their expertise in customs clearance and regulatory compliance helps businesses navigate complex logistics challenges.

Warehousing: With state-of-the-art warehousing facilities, Creseada offers secure storage solutions for various types of goods. Their warehouses are equipped with advanced inventory management systems to ensure accurate tracking and timely distribution.

Transport Logistics: Creseada's transport logistics services include road, air, and ocean freight. They provide reliable and cost-effective transportation solutions, ensuring timely delivery of goods to their destinations.

Multi-Modal Transportation

Air Freight: Creseada's air freight services offer fast and reliable transportation for urgent shipments. They have established partnerships with major airlines to provide competitive rates and efficient service.

Ocean Freight: Their ocean freight services cater to large-volume shipments, offering flexible and cost-effective solutions. Creseada handles both full container load (FCL) and less than container load (LCL) shipments.

Road Freight: Creseada's extensive road transport network ensures the efficient movement of goods within Nigeria and across neighbouring countries. They provide end-to-end logistics solutions, including last mile delivery.

Creseada International Limited's extensive experience and comprehensive logistics solutions make them a trusted partner in Nigeria's supply chain landscape. Their commitment to innovation, efficiency, and sustainability continues to drive their success and support the growth of businesses in Nigeria (Creseada, 2024).

Bollore Transport and Logistics

Bollore Transport and Logistics, now rebranded as Africa Global Logistics (AGL), is considered a major player in Nigeria's logistics sector. They provide a wide range of services including air and shipping transport, customs clearance, container haulage, and warehousing. Bollore has operations in major ports like Lagos and Port Harcourt, as well as in the capital, Abuja. The Lagos and Port Harcourt ports are vital hubs for international trade, handling a significant volume of Nigeria's imports and exports. In addition to their port operations, AGL has warehouse facilities in Abuja, the capital city, enhancing their ability to

serve clients across the country. Formerly known as Bollore Transport and Logistics, the company is considered a significant force in Nigeria's logistics industry. AGL employs a substantial workforce in Nigeria, contributing to job creation and economic development. The company is part of a larger network that employs over 21,000 people across 49 countries. AGL provides tailored logistics solutions for small and medium-sized enterprises (SMEs), helping them overcome logistical challenges and expand their market reach. AGL is committed to sustainable business practices. They have implemented programs to reduce their environmental footprint, such as the Green Terminal initiative, which focuses on eco-responsibility in transport and logistics. AGL leverages advanced technology to enhance their logistics services. This includes real-time tracking systems, automated inventory management, and data analytics to optimize supply chain efficiency (AGL, 2023).

Key Services Provided by AGL in Nigeria

Air and Shipping Transport: AGL provides robust air and ocean freight services, ensuring the efficient movement of goods both internationally and domestically. Their air freight services are designed for time-sensitive shipments, while their ocean freight solutions cater to large-volume cargo.

Customs Clearance: AGL offers expert customs clearance services, helping businesses navigate the complexities of import and export regulations. This ensures smooth and compliant cross-border transactions.

Container Haulage: AGL's container haulage services include the transportation of containers from ports to various destinations within Nigeria. This service is crucial for the seamless movement of goods from entry points to final destinations.

Warehousing: AGL provides state-of-the-art warehousing solutions, offering secure storage and efficient inventory management. Their warehouses are strategically located to facilitate easy access and distribution.

Overall, AGL continuously invests in innovative solutions to improve their service offerings. This includes developing multimodal logistics solutions that integrate rail, road, air, and river transport. AGL's extensive experience and comprehensive logistics solutions make them a trusted partner in Nigeria's supply chain landscape. Their commitment to innovation, efficiency, and sustainability continues to drive their success and support the growth of businesses in Nigeria (AGL, 2023).

MSC (Mediterranean Shipping Company)

MSC is one of the world's largest container shipping companies with a well-established presence in Nigeria. They offer comprehensive shipping services including door-to-door delivery, refrigerated cargo, and project cargo handling. MSC operates from several ports in Nigeria and moves over 200,000 TEU (Twenty-foot equivalent units) of cargo per year. The company operates in key Nigerian ports, including Lagos (Tincan Island and Apapa) and Port Harcourt. These ports are crucial for international trade, handling a significant volume of Nigeria's imports and exports. MSC employs a substantial workforce in Nigeria, contributing to job creation and economic development. The company is part of a larger network that employs over 100,000 people globally. The company provides tailored logistics solutions for small and medium-sized enterprises (SMEs), helping them overcome logistical challenges and expand their market reach. MSC is committed to sustainable business practices. They have implemented programs to reduce their environmental footprint, such as using eco-friendly vessels and optimizing shipping routes to reduce fuel consumption. MSC leverages advanced technology to enhance their logistics services. This includes real-time tracking systems, automated inventory management, and data analytics to optimize supply chain efficiency. MSC continuously invests in innovative solutions to improve their service offerings. This includes developing multimodal logistics solutions that integrate rail, road, air, and river transport (MSC, 2024).

Services Provided by MSC in Nigeria

Door-to-Door Delivery: MSC provides seamless door-to-door delivery services, ensuring that cargo is picked up from the sender's location and delivered directly to the recipient's address. This service simplifies the logistics process for businesses and individuals.

Refrigerated Cargo: MSC offers specialized refrigerated cargo services, also known as reefer services, to transport perishable goods such as food and pharmaceuticals. Their advanced reefer containers maintain the required temperature throughout the journey, ensuring the quality and safety of the cargo.

Project Cargo Handling: MSC handles project cargo, which includes oversized and heavy items that require special handling and transportation. This service is essential for industries such as construction, oil and gas, and manufacturing.

MSC's extensive experience and comprehensive logistics solutions make them a trusted partner in Nigeria's supply chain landscape. Their commitment to innovation, efficiency, and sustainability continues to drive their success and support the growth of businesses in Nigeria.

Kobo360

Kobo360 is a tech-enabled digital logistics platform founded in 2018. It connects manufacturers and cargo owners with truck operators, aiming to streamline and optimize the logistics process across Africa. The company uses data analytics and AI to reduce inefficiencies in last-mile delivery, provide transparency, and optimize routes in real-time. Furthermore, the platform aggregates haulage operations to help cargo owners, truck owners, drivers, and recipients achieve an efficient supply chain. Kobo360 has also deployed significant funds to finance truck drivers and partners, reducing non-performing assets and improving profit margins. The company recently secured a $30 million investment from Goldman Sachs. However, the company faced challenges during the COVID-19 pandemic due to the reduction in economic activities. It has however since stabilized and is experiencing sustainable growth. Kobo360 is addressing significant logistics challenges in

Africa, where logistics can account for over 70% of a product's price. By providing a more efficient and transparent logistics solution, Kobo360 is helping to reduce costs and improve productivity for businesses across the continent (Kobo360, 2024).

Business Model: Kobo360 matches manufacturers and trading houses with truck drivers for cargo delivery. They make advanced payments to truck owners during cargo pickup and complete the payment upon delivery. This model helps in managing cash flow and ensuring timely payments to drivers. The company leverages a robust technology stack to optimize its logistics operations and provide seamless services to its users. Kobo360's technology stack is designed to create a seamless digital ecosystem that connects cargo owners, truck drivers, and other stakeholders, enhancing the overall efficiency and reliability of logistics operations across Africa. They utilise Web Technologies such as HTML5 for structuring and presenting content on the web. They also use Google Analytics for tracking and analysing web traffic and user behaviour. They use Google Fonts to enhance the visual appeal of their website. They use technology for currency formatting and transactions. The company also utilise IPv6 modern internet protocol for better connectivity and security. Furthermore, they use Person Schema for structuring data about individuals. Kobo360 has several mobile apps to cater to different stakeholders such as Kobo Transporter for truck drivers to manage their trips and deliveries. Second is Kobo Customer for cargo owners to track their shipments. They also have a general Kobo App which is a general app for various logistics needs. Furthermore, the company uses data analytics and artificial intelligence to optimize routes, improve delivery times thereby reducing fuel consumption. The AI and data analytics also offer real-time visibility into the logistics process which also streamlines last-mile delivery and minimizes communication gaps. The platform also provides advanced tracking and visibility by providing real-time insights and 360-degree visibility on the status of haulage, ensuring timely and efficient deliveries.

Kobo360 has a significant presence in Nigeria, where it plays a crucial role in the logistics and supply chain industry. Kobo360 has partnered with several major companies in Nigeria,

including Honeywell Flour Mills, Olam, Unilever, Lafarge, Dangote, and DHL. These partnerships highlight the trust and reliability that Kobo360 has built in the industry. With the foregoing partnerships, Kobo360 provides end-to-end haulage services, ensuring timely and efficient delivery of goods across Nigeria. Furthermore, Kobo360 offers working capital, asset financing, and discounts on diesel and auto parts to truck owners and drivers. Registered truck owners and drivers in Nigeria receive training on how to use the Kobo360 application, enhancing their ability to manage trips and deliveries effectively. Kobo360 is also focused in addressing logistics challenges in Nigeria's agricultural sector. By providing efficient transportation solutions, the company helps reduce the waste of agricultural commodities, which is a significant issue in Nigeria. This initiative supports food security and improves the availability of agricultural products.

In 2019 Kobo360 won the "Disrupter of the Year" award at the Africa CEO Forum, recognizing its innovative approach to logistics. The company has also created numerous jobs in Nigeria, contributing to economic growth and development. Kobo360 continues to expand its operations and improve its services in Nigeria. The company aims to further enhance its technology platform, increase its fleet size, and strengthen its partnerships to better serve the logistics needs of businesses across the country.

4.0 METHODOLOGY CHAPTER

4.1 Introduction

This chapter will include the methods that were applied in carrying out the research. These include the philosophical assumptions guided by this research, the purpose of the research, the research logic, the research process, and research output. The research paradigm is first explained and justified. The foregoing includes the philosophical assumptions of the research which determines the applied logic or approach to theory, the techniques for data collection and analysis, and the output of the research (Collis and Hussey, 2021). Second, the research purpose (exploratory research) explains in detail the justification for the research and what the research aims to achieve. Third, the research logic explains and justifies the logical approach to theory. New theories can be proposed or developed entirely new, or existing theories can be enhanced, tested, or applied (Saunders et al., 2009). In this research, a new theory is proposed using abductive reasoning. Fourth, the research process explains in detail the method of sampling, data collection process, data analysis techniques and the research strategy which in this case is an exploratory case study. The type of research design also includes an explanation of the time horizon whether it is longitudinal or cross-sectional. How the research was evaluated in terms of reliability and validity is explained. A detailed explanation of the sequence of the research activities is provided. The research output or outcome explains in detail the contribution of the research to theory and/or practice. The major output of the research is the decision support framework and a detailed justification and explanation of the method for developing the decision support framework is provided. Also, ethical considerations are laid out. According to Saunders et al. (2009), the research onion summarises a research methodology as seen in figure 3.1 below:

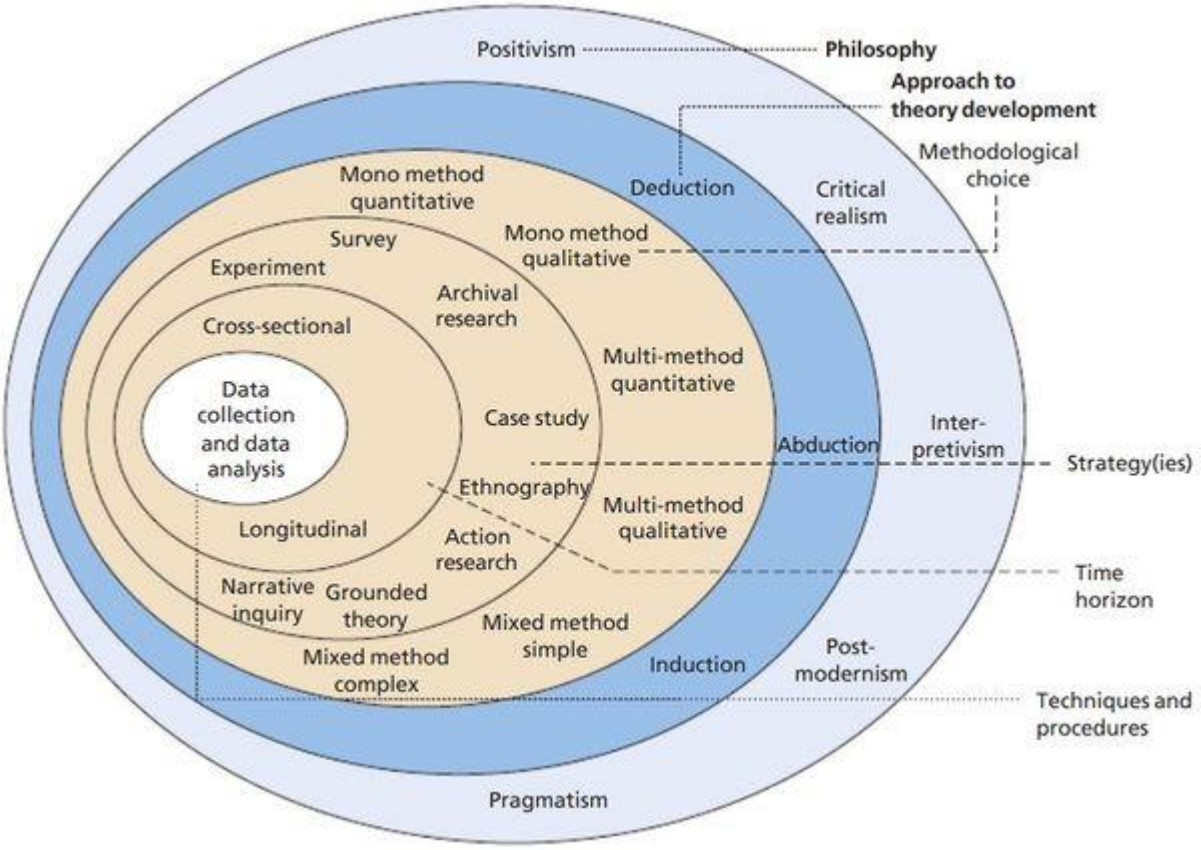


Figure 4.1: Research onion, source: Saunders et al. (2009)

4.2 Research paradigms

According to Collis and Hussey (2021), a research paradigm refers to the philosophical framework that guides how research should be conducted scientifically. It is the framework of approach that represents a researcher's beliefs and philosophy which guides how the research is conducted by the researcher. Collis and Hussey (2021) further noted that philosophy refers to a system or set of beliefs emanating from the study of the fundamentals of the nature of reality, knowledge, and existence.

Gemma (2018) noted that there are two well-known research paradigm that have been well used to guide research methods and analysis. These are "Positivism" and "Interpretivism". Gemma (2018) further noted that positivism deals with objectivity and is therefore involved in proving or disapproving a hypothesis. Ron (2004) noted that examples of positivists research

methods include experiments, survey, and field research. On the other hand, interpretivism contrasts with positivism as it deals with subjectivity (Gemma, 2018).

Pragmatism is another well-known research paradigm used by scholars to implement interventions in various areas of practice (Goran, 2012). Goran (2012) argued that pragmatism is concerned with action and change hence it deals with both knowledge and action. It is therefore used in research that aims to intervene into the world and not merely observing the world (Goran, 2012). Pragmatism is discussed further in table 3 below.

Saunders et al. (2009) argued that there are five research paradigms in business and management, and each has its philosophical assumptions. Of these five paradigms, positivism, interpretivism and pragmatism only are critically discussed in the subsequent paragraphs and in tables 1 to 3 below as these three paradigms are relevant and applicable to this research. The tables 1 to 3 below lays out the philosophical assumptions of these three paradigms in terms of their ontological assumptions (assumptions about the nature of reality), epistemological assumptions (assumptions about what constitutes acceptable knowledge), axiological assumptions (assumptions about the role of value in a research) and their applicable methods of reasoning, data collection and data analysis. This research is associated with pragmatism and a detailed justification for adopting a pragmatic approach is provided below.

4.2.1 Positivism

According to Collis and Hussey (2021), Positivists paradigm originated from the natural sciences and historically, its major assumption in social science lies on the fact that social reality is singular, and objective hence detached from the researcher or the act of investigating it. Positivists paradigm usually involves deductive reasoning with the aim to provide explanatory theories that enables an understanding of social phenomena (Collis and Hussey, 2021). The positivists paradigm belief that knowledge is obtained from positive information because it can be verified scientifically. The foregoing implies that it is possible to

provide mathematical evidence for every assertion that is rationally justifiable (Collis and Hussey, 2021). Collis and Hussey (2021) noted this about positivists: “They still apply logical reasoning so that precision, objectivity and rigour underpin their approach, rather than subjectivity and intuitive interpretation” (Collis and Hussey, 2021, p. 40). Therefore, under this paradigm, theories provide basis for explanation, phenomena are anticipated, and their occurrence can be predicted hence can be controlled. Explanation in this case, involves developing or establishing causal relationships between the variables by establishing causal laws which are linked to an integrated or deductive theory (Collis and Hussey, 2021). Therefore, social, and natural realities are both equally seen as being bound by certain laws that are fixed in a cause-and-effect sequence. The foregoing already indicates the shortcoming or inadequacies of the positivists paradigm as social sciences are often behavioural and cannot be bound entirely by fixed laws. The foregoing is a major reason why this research is not guided by positivism though logistics and supply chain literature is often associated with positivism (Bell et al. 2022). The criticisms of positivism are therefore as follows:

- It is not possible to separate human behaviour from their social context where they exist as laws that are applicable in certain societies may not be applicable in other societies because factors such as cultural, socio-economic, and political can affect the behaviour of people in other societies. An example is the observation where people in less developed countries and in less privileged communities in developed countries tend to buy speculative financial products such as shares, stocks, and crypto currencies when their prices are rising with the hope that they will continue to rise. This contrasts with the universal law of demand and supply established through the positivist paradigm where the higher the price the lower the demand; it is therefore better in some cases to study a social phenomenon on a context-by-context basis.

- People cannot be well understood without studying their perceptions they hold of their own activities.
- A research design that is highly structured imposes constraints on the results and lacks richness.
- Complex social phenomena may not be capturable in a single measure as

The shortcomings of positivism as laid out above in its criticisms are the reasons this research is not entirely guided by the positivists research paradigm.

Table 3.1 below summarises positivism in terms of its ontology (the nature of reality), its epistemology (what constitutes acceptable knowledge), its axiology (the role of value in a research) and its applicable methods. These philosophical assumptions of the other two relevant paradigms to this research are also described in tables 3.2 and 3.3.

Philosophical assumptions of positivism

Table 4.1: Philosophical assumptions of positivism

Nos	Ontology	Epistemology	Axiology	Methods
1	Real external, Independent	Empirical method, Observable and measurable facts	Value-free research	Employs deductive reasoning
2	Inarguable one true reality (universalism)	Synonymous to law type generalisations	Researcher is removed, neutral and remains independent of what is investigated	Well structured, employs large data samples, and measurement

3	Granularity of things broken down into small parts Ordered	Causal explanation and prediction as contribution	Researcher keeps an objective stance	Employs quantitative methods of analysis, but several kinds of data can be analysed

4.2.2 Interpretivism

Collis and Hussey (2021) noted that Interpretivism emerged as a result of the perceived inadequacies of Positivism. Collis and Hussey (2021) further noted that interpretivism is based on the belief that social reality is not always objective but often subjective as it is shaped by the perception, we hold of it. Interpretivists therefore argue that the researcher cannot be separated from the social world as is the case with the natural and physical sciences. Interpretivists therefore argue that the process of investigating social realities has an impact on it and this makes interpretivists to focus more on exploring the complexities of social phenomena with the aim of gaining interpretive understanding which is in contrast to positivism which only focus on measuring social phenomena. The subjective nature of interpretivism is a major reason why it is not adopted by this research as this undermines the reliability of the research findings (Collis and Hussey, 2021).

Saunders et al. (2009) further noted when an interpretivist researcher undertakes a business or management research, they would primarily focus on understanding the foundational meanings associated with organisational life. Hence, the principal focus of the researcher would be far from emphasising rationality, but perhaps the principal focus of the researcher would be to discover irrationalities. Hence, the researcher who is focused on studying an organisation's supply chain strategy may focus on understanding the ways in which it fails due to unseen reasons, perhaps reasons which may not be obvious even to those involved

with the strategy. The researcher therefore rather than trying to change things is more concerned in understanding how the organisation is run (Saunders et al., 2009). Again, while the foregoing approach is good, emphasising irrationalities in itself may not provide solutions to problems. This again explains why it is not adopted for this research. The philosophical assumptions of interpretivism in terms of ontology, epistemology, axiology, and applicable methods are summarized in table 4.2 below:

Philosophical assumptions of interpretivism

Table 4.2: Philosophical assumptions of interpretivism

	Ontology	Epistemology	Axiology	Methods
1	Usually rich and Complex. Usually constructed socially through culture and language	Theories and concepts of interpretivists research are often associated with the notion that organizations are socially constructed and exist only in the perceptions of people (Capper, 2018).	Research is value-based and subjective. Researchers are sometimes also researched especially when methods such as systematic literature review and content analysis are used	Always employs inductive reasoning
2	Involves several meanings, Interpretations and realities	Uses narratives, stories, perceptions, and interpretations	Interpretations made by the researcher is key to contribution	In-depth investigations made from small samples

3	Employs several processes, experiences and practices	New understandings and world perception as output	Researcher reflexive	Employs Qualitative methods of analysis, however several kinds of data can be interpreted

4.2.3 Pragmatism

The two main paradigms discussed above represent the two extremes of what is usually classified as quantitative (positivism) and qualitative (interpretivism) research. These paradigms are mutually exclusive in their philosophical assumptions about the world and the nature of reality. In business and management research, the philosophical assumptions of the paradigm which the researcher identifies with determines their choice of methodology which they apply to carry out the research. This is the case with positivists and interpretivists; however, pragmatism argues that the nature of a research question should determine the philosophical assumptions of the research and often advocates the use of a mixed methods from both positivism and interpretivism (Collis and Hussey, 2021). Hence, in a pragmatic paradigm, the philosophical assumptions are often established after the research questions and the choice of methods have been determined. The mixed methods approach of pragmatism enables pragmatists to collect, analyse and integrate both quantitative and qualitative data in a single study (Collis and Hussey, 2021). Therefore, methods that are suitable in answering the research question(s) are selected irrespective of the paradigm they belong to. Creswell (2014) in Collis and Hussey (2021) argued that Pragmatists have three main assertions as follows:

- Pragmatism does not belong to any of the two main paradigms hence is not associated to any particular system of philosophy and reality.
- Pragmatists asserts that individual researchers have the academic freedom to choose methods from any paradigm without compromising on rationality in the choice of research design and rigour in the application of research methods.
- Pragmatists believe that researchers need to stop asking questions regarding the laws of nature and reality as satisfactory answers are hardly provided.

Table 4.3 below summarizes pragmatism in terms of its assumptions of ontology, epistemology, axiology, and methods:

Philosophical assumptions of pragmatism

	Ontology (nature of reality)	Epistemology (what makes up acceptable knowledge)	Axiology (role of values)	Typical methods
1	Complex, rich, external	Practical meaning of knowledge in specific contexts	Usually driven by value	Follows a research problem and research questions
2	Reality is the practical consequences of ideas	'True' theories and knowledge are those that enable successful action	Research begins and continues with the influence of the researcher's doubts and beliefs	Employs several kinds of methods: mixed, multiple, qualitative, quantitative, action research

3	Usually involves many processes, experiences, and practices	Focused on practical issues and its relevance to these. Provides solutions and informs future practice as part of contribution.	Researcher examines their own feelings, reactions, and motive and how these influence the research	Emphases on providing viable or practical results and solutions

Adoption of pragmatic approach

Table 3.4 in the next page below summarizes philosophical assumptions of both positivists and interpretivists paradigms that are present and philosophical assumptions of both paradigms that are absent and shows why a pragmatic approach applies.

Table 4.4: Pragmatic research adoption: elements of positivism and interpretivism that are absent and those present in this research and showing why pragmatism is applicable.

No.	Philosophical assumptions of positivism present	Philosophical assumptions of positivism absent	Philosophical assumptions of interpretivism present	Philosophical assumptions of interpretivism absent	Pragmatism
1	Ontological assumption: Inarguable one true reality (universalism). Refers to constructs such as cost and efficiency, core competence that have been established in the literature as reasons for logistics outsourcing	Epistemological assumption: Synonymous to law type generalisations. Causal explanation and prediction as contribution which is applicable in an explanatory and predictive research respectively. Absent in exploratory research	Ontological assumption: Usually rich and Complex. Involves several meanings, Interpretations and realities (such as the implications of the results of the statistical t-test and thematic analysis as discussed in discussion chapter).	Ontological assumptions: Usually constructed socially through culture and language. Employs several experiences and practices. This research is not constructed with the influence of culture	Ontological assumptions: Complex, rich, and external Reality is the practical consequences of ideas. Employs several processes. Such as the multiple quantitative methods, content analysis, thematic analysis, and the decision support framework.

2	Epistemological assumption: Empirical method, Observable and measurable facts as done in the t-test and correlation analysis	Research logic: Employs deductive reasoning. This research does not employ deductive reasoning in its final conclusions rather an abductive reasoning.	Axiological assumption: Researchers are sometimes also researched especially when methods such as systematic literature review and content analysis are used as was done in this research. Researcher examines their own feelings, reactions, and motive and how these influence the research. These were examined to prevent bias. Epistemological assumption: uses perceptions as employed by this research through expert opinion. Uses interpretations as employed by this research	Epistemological assumptions: theories and concepts of interpretivists research are often associated with the use of narratives, stories. This research did not use narratives or stories	Epistemological assumption: Practical meaning of knowledge in specific contexts. Such as developing a Nigerian third-party logistics decision support framework. 'True' theories and knowledge are those that enable successful action. Focused on practical issues and its relevance to these. Provides solutions and informs future practice as part of contribution. These were done in this research through the decision support framework and recommendations to practice

			through thematic and content analysis. New understandings and world perception as output. This is evidenced in the new decision support framework of this research and the proposed theory that partly explains why logistics outsourcing is less outsourced in developing countries such as Nigeria.		
3	Axiological assumptions: Value-free research. Researcher is removed,	Data collection: Well structured, employs large data samples, and measurement. Data sample of this research is small.	Methods: In-depth investigations made from small samples Employs Qualitative methods of analysis such as the content	Axiological assumptions: Research is value-based and subjective.	Axiological assumptions: usually driven by value. The researcher in this case values outsourcing because of its possible impact on costs efficiency and its impact on performance. Research begins and continues with the influence of the researcher's doubts and beliefs. The

	neutral and remains independent of what is investigated. Researcher keeps an objective stance as is often done in pragmatic research.		analysis and thematic analysis of semi-structured interviews.	Interpretations made by the researcher is key to contribution. This is not the case with this research as the researcher maintains an objective stance.	researcher's beliefs about logistics outsourcing in this case refers to the low level of logistics outsourcing in Nigeria as seen in the preliminary research finding and in the literature review. Researcher examines their own feelings, reactions, and motive and how these influence the research. These were examined to prevent bias
4	Method of data analysis: Employs quantitative methods of analysis as was done in this research through the statistical t-test, descriptive statistics,			Research logic: employs inductive reasoning. This research rather employed abductive reasoning	Follows a research problem and research questions. Research problem refers to understanding the reasons for the low levels of logistics outsourcing in Nigeria and why the market is immature. The research question tries to address the potentials of the third-party logistics market.

	and correlation analysis.				Employs several kinds of methods: mixed, multiple, qualitative, quantitative, action research. The research employed mixed methods and multiple quantitative methods. Also, the research output can be actioned upon by practitioners.

Table 3.4 above show that essential elements of positivism such as deductive reasoning, purpose of research such as explanatory and predictive research, and large data samples are absent in this research.

Also, from the axiological perspective the interpretivist paradigm is too subjective while this research maintains an objective stance. However, from the epistemological perspective, the outcome of an interpretivist research tries to bring in new understanding and world perceptions (that is develop new theory or enhance existing theory). In this research, a new theory is proposed that partly explains why outsourcing is less outsourced in developing countries such as Nigeria and the research also sheds light on an aspect of transaction cost economics (TCE) of outsourcing. Furthermore, the research also proposes a new type of third-party logistics decision support framework hence that element of interpretivism is present in this research.

On the logic side of things, inductive reasoning cannot be applied to this research as the research does not aim to generalise findings from the Nigerian case study to other similar developing countries with similar characteristics. Finally, from the ontological aspect, in business research, interpretivist assumptions are often socially constructed with elements of culture in it making its findings less objective and less reliable (Saunders et al. (2009). This research on the other hand maintains an objective stance.

The table also shows how the philosophical assumption of pragmatism is applicable to this research. Pragmatic approach allows researchers to conduct research in an innovative and dynamic way. Hence pragmatic approach is flexible as is the case with exploratory research. The flexibility of pragmatic approach allows it to use research designs based on what will work best in finding answers to the questions being investigated (Collis and Hussey, 2021; Goldkuhl, 2012). This is why a pragmatic approach was adopted for this research as the research investigations involves a context with complex characteristics and where obtaining primary data such as company records is notoriously difficult and therefore required an approach that enables the researcher to implement whatever will work. The foregoing entails

abductive reasoning as Bell et al. (2022) notes that abduction involves the researcher selecting the best explanation from competing explanations or interpretations of limited available data.

4.3 Mixed method research strategy

According to Collis and Hussey (2021), mixed method involves using more than one method of data collection and analysis from different paradigms.

Denscombe (2008) in Baškarada and Koronios (2018, pg.3) "shows that some researchers primarily use mixed methods in order to improve data accuracy, produce a more complete picture". Baškarada and Koronios (2018) argued that a mixed method research design should be evaluated based on its practical and empirical implications. The foregoing implies that mixed methods research is often employed when the nature of the research requires a combination of methods from more than one paradigm to produce a more accurate and complete research which can be evaluated by its contribution to knowledge and/or practice.

This research is mixed methods research as it employs some elements of the positivists and elements of the interpretivist's paradigm but does not have sufficient elements of any of these paradigms to belong to any of these two major paradigms. The mixed methods approach which is often associated with pragmatic research and some scholars have argued that it is more reliable to use (Yvonne Feilzer, 2010; Mitchell and Education, 2018; Schoonenboom, 2019). This is because the same or similar phenomenon of interest is investigated and tested multiple times using different and the results are the same, similar or corroborates each other therefore making mixed methods reliable to use. The foregoing is the major reason why mixed methods is adopted for this research. The mixed methods approach involves combination of methods from both the interpretivist and positivists research paradigms to produce a more complete research project (Schoonenboom, 2019; Collis and Hussey, 2021). The interpretivist approach is not solely adopted for this research nor is the positivist approach solely adopted, however elements of the interpretivists

approach such as qualitative data collection methods of semi-structured interviews, qualitative content analysis and thematic analysis are used in this research. Also, elements of the positivist approach such as quantitative data collection methods of structured interviews and Likert scale questionnaires, and correlation analysis and statistical t-test. Hence, the research adopted mixed methods where various methods were used to investigate the same phenomenon and yielded similar results hence establishing the reliability of the mixed method research strategy.

4.4 Classification of the major areas of research

According to Collis and Hussey (2021) research are classified based on their purpose, logic or reasoning, process, and outcome or output of the research.

4.4.1 Purpose of research

The purpose of research refers to the reason why the research is needed or required (Collis and Hussey, 2021). This then informs the aim of the research or what the research seeks to achieve. There are four main purposes of conducting research namely: exploratory, descriptive, explanatory, and predictive.

Descriptive research

Descriptive studies are often conducted to describe the characteristics of a phenomena. The aim of a descriptive research is to provide a description that serves as a basis for arguments that are built on empirical evidence (Collis and Hussey, 2021). Descriptive research therefore describes phenomena in its detailed characteristics based on empirical evidence. Descriptive research is often used to provide insights about a population for informed decision making and/or solutions to problems. It also provides a basis for further research investigating a cause-and-effect relationship of a phenomenon of interest. Descriptive research questions usually start with ‘what’ and ‘how’. Descriptive research can be

qualitative or quantitative and can be associated with the positivist or interpretive paradigms. However, descriptive research is often quantitative using descriptive statistics and often associated with positivist paradigm. This research is not descriptive research though there are elements of this research that employed descriptive statistics; however, the overall purpose of this research requires a mix of qualitative interpretivist research with quantitative positivist research as explained in table three above. Hence, the purpose of this research is beyond descriptive research.

Explanatory research

Collis and Hussey (2021) noted that explanatory research is like a continuation of descriptive research where the researcher goes beyond describing in detail the characteristics of the phenomena to explaining the cause and effect of the phenomenon that is being studied. Explanatory research is therefore confirmatory in nature as it seeks to confirm and explain cause and effect relationships through hypothesis testing using quantitative method or techniques and employing deductive reasoning. Explanatory research always associated within the positivist's paradigm, therefore explains a problem by confirming its cause from which solutions can be provided. Explanatory research being a positivist research often aims to uncover universal truths by testing propositions for causality or association against empirical evidence. Empirical evidence in this case refers to data collected regarding each variable based on systematic observation or experience (Collis and Hussey, 2021). This research is not an explanatory research as it does not seek to explain a cause and effect of a particular phenomenon such as a regression analysis with an independent and dependent variable. The purpose of this research not being an explanatory research further justifies why it is not within the positivist paradigm.

Predictive research:

Predictive research goes beyond explanatory research to generalise from an analysis of a phenomena by making predictions because of generalized relationships. Predictive research

usually associated with the positivist paradigm, therefore predicts that an outcome or solution to a problem in a particular research will be applicable to similar problems in somewhere else so long as the predictive research is able to provide a well-founded strong solution based on a direct understanding of applicable causes. Predictive research is often helpful in 'what if' case scenarios. This research is not a predictive research because it does not seek to make predictions from generalised relationships. The foregoing further justifies why this research is not within the positivist paradigm.

Exploratory research:

This research is not confirmatory research because it does not have an existing hypothesis which it seeks to validate or confirm. While the research topic is not a virgin area of research in the logistics literature, the research title, focus, aim and objectives is a seemingly virgin area and therefore do not have a prior hypothesis (idea) about the relationship between two or more variables under investigation by gathering and analysing data to see if an idea in form of a hypothesis is supported by data as would have been the case in a confirmatory research which usually have an explanatory or predictive purpose (Nilsen et al., 2020; Collis and Hussey, 2021). Hypotheses were however tested in the correlation analysis with the aim of contributing findings to theory development which is part of the research output. However, this research aims and objectives are not met through hypothesis testing rather by answering a set of research questions. Furthermore, because of the under-researched nature of the research's specific areas of focus, aim and objectives, research that is exploratory in purpose is first required.

Collis and Hussey (2021) noted that exploratory research is conducted to provide an improved understanding of a phenomena where there is a dearth of research. Collis and Hussey (2021) further noted that it is also used to evaluate the feasibility of a much larger study in the future. Gorman and Macintosh (2014) noted that exploratory research is used in cases where the phenomenon or issue of study is new or when the process of collecting

data is challenging for some reason. Gorman and Macintosh (2014) further noted that exploratory research can be used when there is a general idea or a specific question that the researcher is interested to study but there is not much pre-existing knowledge or paradigm from which the study can be conducted. Stebbins (2001) notes that exploratory research aims at understanding why a phenomenon or situation operates or is the way it is and to generate preliminary hypothetical explanations for it rather than testing hypothesis like explanatory research would do. Furthermore, Cuthill (2002) argues that exploratory research aims at developing ideas that reveal the reasons for a potential cause/effect relationship and that this happens when the researcher is beginning to understand what they are observing while in the process of building a potential cause/effect relationship. This type of research aims to look for patterns and develop ideas rather than testing propositions. Collis and Hussey (2021) further noted that typical techniques used in exploratory research includes case studies, observation, and historical analysis with both quantitative and qualitative data. The foregoing techniques are usually very flexible hence does not require a lot of constraints on the kind of activities employed or on the kind of data collected as is often done in a research within the positivist or interpretivist paradigms. Often exploratory research assess which existing theories can be applied to the research problem or whether new ones need to be developed. Exploratory research is usually quite open and flexible and focuses on gathering a wide range of impressions. Hence, exploratory research rarely aims to provide conclusive answers to problems and challenges but often provide guidance or road map for future research if applicable (Collis and Hussey, 2021). This research is an exploratory research.

The purpose of this research explains why it is an exploratory research. First, the research seeks to assess the potentialities of the logistics outsourcing market in Nigeria. Hence, it does not seek to confirm the cause and effect of any particular problem in the logistics outsourcing market in Nigeria as an explanatory research would do, rather it seeks to investigate the level of logistics outsourcing in Nigeria benchmarked against the logistics

outsourcing market of more matured markets of the developed countries such as the UK. Also, the study proposes a Nigerian logistics outsourcing decision support framework based on the findings of the research. This decision support framework does not seek to change or increase the level of logistics outsourcing rather it seeks to help companies make more educated or intelligent logistics outsourcing decision. The foregoing is part of the contribution to knowledge and part of the recommendations to practice that the research is making. This decision support framework has often not been proposed prior to this research in the Nigerian context hence the novelty. Therefore, as stated earlier an exploratory approach is required in such contexts where there is little or no prior knowledge or theory. In this case, there is currently not much research on third-party decision support framework that supports Nigerian organisations in deciding whether to outsource logistics activities or not including decision support framework that supports organisations on which third-party logistics firm in Nigeria to select for outsourcing.

Also, the research does not merely seek to describe the characteristics of logistics outsourcing in Nigeria based on empirical evidence as is the case in a typical descriptive statistical. Rather the research is explorative because of the dearth of research in this area in Nigeria hence there is not enough empirical evidence to provide a detailed description of the characteristics of logistics outsourcing practice in Nigeria and the data collection process in Nigeria has been known to be notoriously challenging (Adebambo, et al., 2015; Etokudoh et al., 2017).

Also, the few available studies on logistics outsourcing in Nigeria always tends to focus on one sector and do not study the individual logistics activities such as inventory management or warehouse management rather the studies tend to study logistics outsourcing generally. Hence this research seeks to provide knowledge in these under-investigated area as a typical exploratory research does (Gorman and Macintosh, 2014).

This study also provides a road map for future studies in the third-party logistics literature in Nigeria as an exploratory research often does (Collis and Hussey, 2021). The foregoing may

include further detailed investigation into individual logistics outsourcing activities such as warehousing in various sectors in Nigeria including sectors that were not covered by this study such as sea freight. The study can also serve as a road map for further detailed study into third-party logistics decision making in Nigeria perhaps on a sector-by-sector case study descriptive basis or on a sector specific cause and effect explanatory basis.

4.4.2 Research logic

Deductive reasoning

Deductive reasoning involves gathering facts in order to confirm or disapprove relationships that have been hypothesized among variables that have been deduced from existing body of knowledge (Ghauri and Gronhaug, 2005). In this type of research, the researcher deduces hypothesis from existing research or literature and scrutinize it empirically in a particular context, scenario, or situation through testing to see if the hypothesis is applicable or acceptable in this particular case or not (Ghauri and Gronhaug, 2005). Collis and Hussey (2021) argued that the deductive method deduces particular instances from the general theories or generalized inferences. Hence, deductive reasoning is often referred to as going from the general to the particular. Deductive research is also always confirmatory and always associated with quantitative methods of data collection and data analysis techniques (Collis and Hussey, 2021; Ghauri and Gronhaug, 2005). The findings may not necessarily always be true in social contexts which mostly studies behaviours and attitudes hence the validity of deductive research is always low in business research but high in reliability (Collis and Hussey, 2021). Hence, deductive approach is rather best suited to natural and physical sciences (Bell et al., 2022). This is one of the reasons why deductive approach was not adopted in this study as the research not only studied hard factors such as cost efficiency but also studied how soft factors such as corruption can affect levels of logistics outsourcing. Such soft factors are difficult and, in some cases, too complex to be studied using a deductive approach. Hence, it is best to be studied on a contextualized basis using either a mix of both quantitative and qualitative methods or multiple qualitative methods. Also, the

areas of investigation of this research are virgin in Nigeria and there are little existing body of knowledge or literature from which hypothesis can be deduced and tested for confirmation. Hence, the adoption of an exploratory approach for this research which requires a type of reasoning that is different from deductive logic.

Inductive reasoning

Induction on the other hand is based on empirical observations rather than logic (as is the case with deductive reasoning) by drawing general conclusions from empirical observations. It starts with observations, then draws findings from the observations and builds new theory(ies) by incorporating findings with existing theories or literature hence improving the existing theories (Ghauri and Gronhaug, 2005). Therefore, in inductive research, theory is the outcome of research (Bryman and Bell, 2003; Ghauri and Gronhaug, 2005). Collis and Hussey (2021) argued that inductive reasoning induces general inferences from particular cases which is the direct opposite of deductive reasoning. Hence, since inductive reasoning involves going from particular cases to statements that induce general patterns or theories, it is therefore often referred to as going from the particular to the general which is the reverse of deductive reasoning (Collis and Hussey, 2021). An example of inductive reasoning in social research is a case study research where a researcher has successfully observed that production levels generally go down after two hours of shift in a particular company hence induces that generally production levels vary with length of time worked. While the forgoing generalization may be true in most cases, the reliability of the research can be questioned as after two hours of shift productivity may still be very high or even higher in some companies hence the reliability or replicability of the research may be questionable as different results may be obtained if the case study research is repeated with the same working time in a different company. This is why this approach was not adopted by this research. However, inductive research within an interpretivist paradigm does not necessarily require its qualitative measures to be replicable or reliable as it is in the positivists deductive sense (Collis and Hussey, 2021). The foregoing can be argued as a major limitation of inductive

approach in research, and which is one of the reasons for not adopting inductive reasoning in this research as the reliability issues of inductive reasoning makes it less credible. Also, key concepts that are measured in this research such as cost efficiency are positivist constructs that will require a quantitative method of data collection and analysis hence an inductive reasoning will not be appropriate.

Abductive reasoning

According to Bell et al. (2022) abductive reasoning in business and other social scientific research discipline have recently grown in popularity owing mainly to the limitations of deductive and inductive reasoning. It is premised on the weakness of deductive reasoning which has been criticized for its reliance on strict logic of theory-testing and coming up with hypotheses, a problem arises where it is not clear how to select the theory for testing. Another criticism of deductive approach is its applicability or validity in business and other social science research as noted earlier. This is because these involves behavioural science where complex soft factors may not be capturable or well represented by assigning numerical values (Collis and Hussey, 2021). Hence highly structured quantitative research design imposing constraints on the results may ignore other relevant findings. Inductive reasoning on the other hand is criticized for its reliance on empirical data to build theory whereas in some cases no amount of empirical data might necessarily be enough to build theory (Bell et al., 2022). As noted earlier, Inductive reasoning is also criticized for its lack of replicability and reliability as these are often not considered necessary (Collis and Hussey, 2021). Abductive reasoning therefore is a third way of reasoning which overcomes the foregoing limitations of deductive and inductive reasoning, and it is mainly based on pragmatists perspective (Bell et al., 2022). Abductive reasoning is often applied to research that starts with a puzzle or surprise and then aims to explain it. Puzzles may arise when an empirical phenomenon cannot be accounted for with existing theory or literature. Abductive reasoning tries to identify the conditions upon which the phenomenon becomes less puzzling hence turning surprising fact into the usual way (Bell et al., 2022). Abduction involves the

researcher selecting the best explanation or best guess from competing explanations or interpretations of limited available data. Abductive reasoning uses cognitive reasoning to make educated guess from available data to build theory or provide explanation. “This is related to hermeneutics (the study of interpretation) and the philosophical idea of the ‘hermeneutic circle’ through which understanding is seen as a continuous dialogue between the data and the researcher’s pre-understandings” (Bell et. al., 2022, p. 25). Alvesson and Karreman (2007) describes abductive reasoning as important in enabling the researcher to be open to the possible surprises that may arise from the data instead of using the data to confirm their pre-understandings. This research employs abductive reasoning.

Justification for Adopting Abductive Reasoning

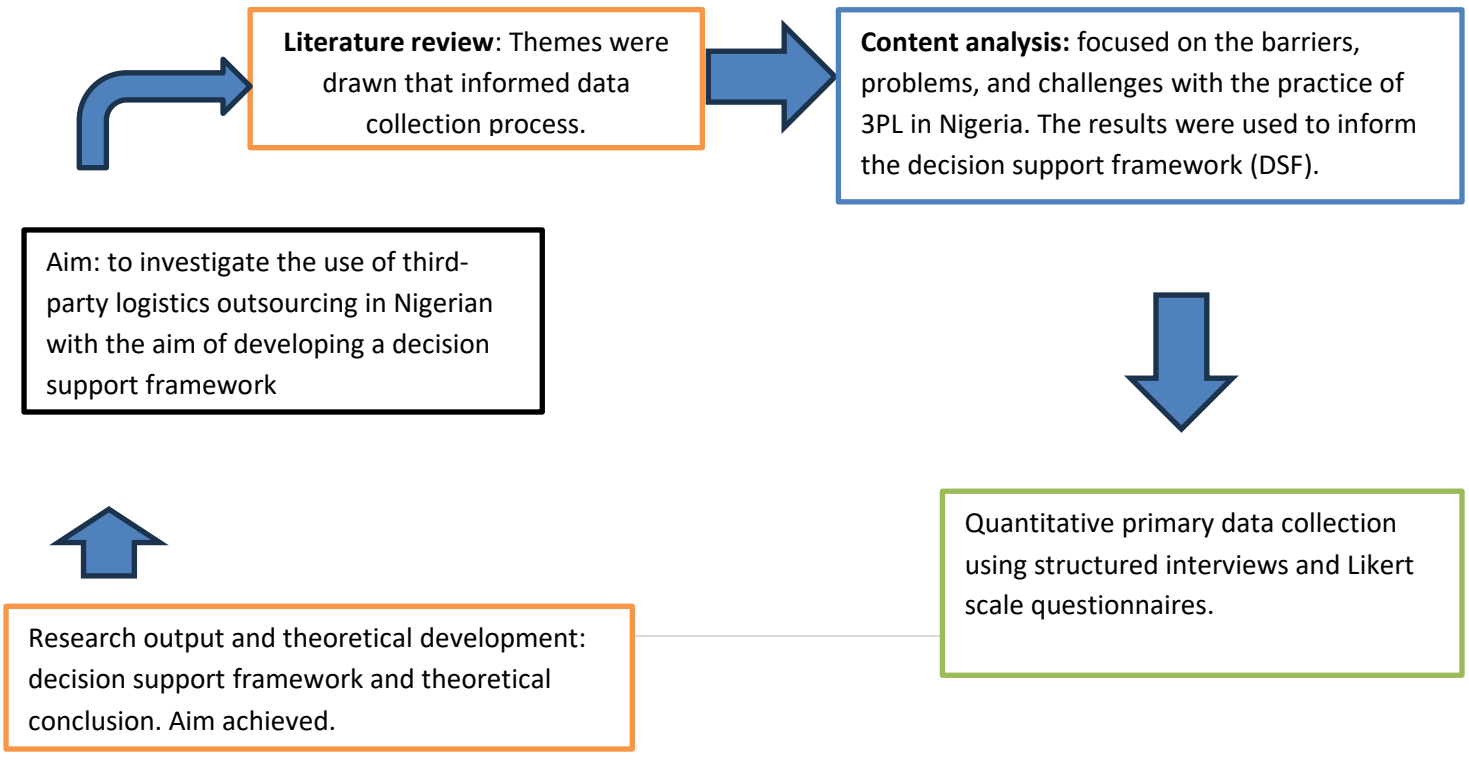
This research is approached through abductive reasoning as the research does not seek to test theories in the Nigerian case nor does it seek to develop and generalize theories from the Nigerian case study. The research rather seeks to provide the most educated explanation or best guess to explain the puzzle about logistics outsourcing across sectors in Nigeria. The puzzle that has arisen in this case is the dearth of theories or literature that explains the level of logistics outsourcing in Nigeria and the potentials for growth in the Nigerian third-party logistics market. Since, there is little or no research and therefore limited available data about this phenomenon, the research adopts abductive reasoning to provide the most educated guess or best explanation from the limited available data about the level of logistics outsourcing across sectors in Nigeria from which contribution to knowledge is provided and recommendations to practice is made. As the research does not seek to provide confirmatory inferences about any existing theories on levels of logistics outsourcing in developing countries such as Nigeria (as these theories do not exist) nor does it seek to test the relationship between the levels of outsourcing of a particular logistics activity and a sector in Nigeria, the findings of this exploratory research can rather be built upon as theoretical basis upon which such aforementioned research can be conducted. Hence, as these are virgin areas of research interest, an exploratory research with abductive approach

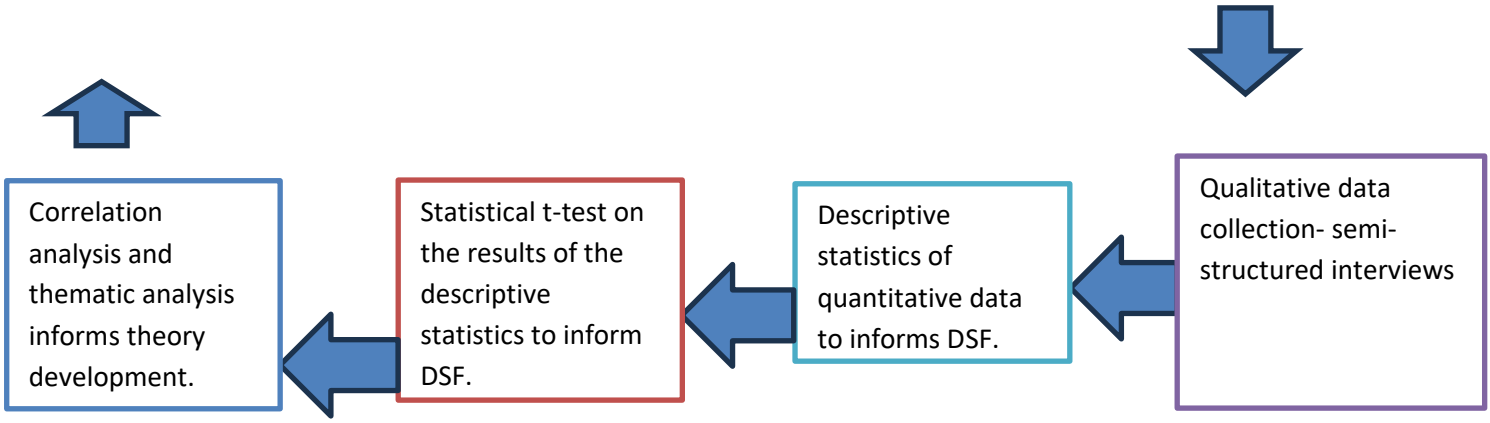
is first required to come up with the theoretical or hypothetical basis upon which further descriptive and explanatory research can be conducted. This is because abductive reasoning is the most suitable approach to achieve the purpose of the research being exploratory, by being able to use the best logical explanation from limited data in a seemingly virgin area to come up with theories that can possibly be confirmed in further research. Such research as this one, can also be built upon to provide detailed description of the characteristics of levels of logistics outsourcing in Nigeria.

Also, the research does not seek to use the Nigerian case study to generalise about factors affecting levels of logistics outsourcing in developing countries as this is not possible since socio-economic and political issues are peculiar to each country. Hence, to generalise about factors that affect levels of logistics outsourcing in developing countries, primary and secondary data will need to be collected from all developing countries and analysed in order to generalise and come up with law-like theories about levels of logistics outsourcing in developing countries. The funding to do the foregoing is not readily available to the researcher.

4.5 Research Design and Sequence of Research Activities

4.5.1 Map of Research Stages





Cross-sectional research

Bell et al. (2022) noted that cross-sectional research is often referred to as a social survey design however a cross-sectional research design is more generic than most social surveys that are experimental and employs structured observations and official statistics. Bell et al. (2022) further noted that the key elements of a cross-sectional research design are as follows:

- A cross-sectional research design is interested in variation. In business research such as this research, variations in the phenomenon of interest may include variation in sectors, activities of interest and geographical locations. Hence, as stated earlier, the gaps identified in the literature such the dearth of a multi-sectoral research in third-party logistics in Nigeria and a dearth of research that analysed the individual third-party logistics activities in Nigeria and that compared each logistics activity against each other. These aforementioned under researched areas deals with variations and this research has addressed them thereby filling the gaps in the literature. Hence, descriptive statistics and statistical t-test were used to show the

differences in frequencies of numerical values between sectors and to test if the differences between the various outsourced logistics activities are statistically significant respectively. Statistical t-test was used instead of Analysis of Variance (ANOVA) or a z-test because Collis and Hussey (2021) noted that t-test is often used for small data samples. This is because a t-test only compares the difference between two sets of data in each test hence t-test has been recommended for data samples below 30 (Collis and Hussey, 2021). The quantitative data was collected from only 6 data samples hence the use of t-test. This research also demonstrates variations by looking at the differences in the levels of logistics outsourcing between developing countries such as Nigeria and developed countries such as the UK. This was done in the comparative content analysis of the barriers, challenges and problems associated with third-party logistics practice between the UK and Nigeria and in the literature review.

- Bell et al. (2022) further noted that in a cross-sectional research design primary data is collected at the same time period or simultaneously unlike in a longitudinal experimental research design where data is collected over period of time sometimes spanning into months, years and in some cases even decades. This is because longitudinal research is experimental and aims to establish causality in order to provide answers, solutions, or interventions and to predict (Bell et al., 2022). Hence different phases are often required to establish trends in the phenomenon of interest. In the case of this research data was collected simultaneously.
- Bell et al. (2022) also noted that cross-sectional research design requires quantitative or quantifiable data in order to establish variations or differences between cases. Bell et al. (2022) further notes that one of the major reasons for quantification is that it provides the researcher with a benchmark that is consistent. Hence, Likert scale questionnaire was used to collect primary data in a quantifiable manner in this research.

4.5.2 Data sampling

Purposive sampling

Non-probability or purposive sampling technique was employed in which objects of study are selected because they possess the characteristics that are required in the research sample. According to Collis and Hussey (2021), in purposive sampling, participants are selected based on the level of experience of the phenomenon that they possess. This sampling method was employed hence managers and senior logistics staffs of the fifty-one selected companies for data collection were targeted. These fifty-one companies were selected because they include both SMEs and large corporations and they represent various sectors in Nigeria, and they are involved in a lot of logistics activity.

Snowball sampling

The research also employed snowball sampling method. According to Collis and Hussey (2021) snowball sampling method is like purposive sampling method as people with the required level of experience in the phenomenon of study are targeted through referrals from their colleagues. It is a system of sampling where participants are asked for referrals to similar people with the same level of experience in the phenomenon of interest that may also be willing and available to participate in the research. Three of the participants in this research were contacted through this method.

Convenience sampling

According to Bell et al. (2022), convenience sampling is a sampling technique that is simply available and easily accessible to the researcher. Bell et al. (2022) is often associated with issues of generalizability. This is because convenience sampling does not necessarily have to recruit participants who represent the target population but participants who are available and accessible. Hence, Bell et al. (2022) argued that convenience sampling is often acceptable in case where a chance presents itself to gather data, and it represents a very good opportunity to be missed. However, Bell et al. (2022) further argued that the findings

from such data will often not be definitive but perhaps be used as a springboard for further research with definitive findings or create links with existing findings in a particular research area. The following bullet points provides justifications for using convenience sampling:

- This research adopted convenience sampling as a backup plan if the other previous sampling techniques fails. However, it was approached with criteria that is required to select only industry experts.
- Second, the participants recruited through convenience sampling are representative of the target population as they are industry experts. Only industry experts with relevant experience were selected. This was one of the criteria for selecting participants (Emerson, 2016)
- Third, they were recruited not only through convenience sampling but also through snowballing that is by referrals. This means that the researcher got other participants through expert referrals (Emerson, 2016).
- Fourth, the researcher made sure that only industry experts with experience in logistics outsourcing are recruited thereby sticking to the purposive sampling principle and this also contributed to the low response rate.

Participant selection bias

Self-reflection: the researcher regularly reflected on his own beliefs and values such as pragmatism. The researcher kept a reflexive journal on which these reflections were documented. The researcher ensured that despite their own personal beliefs and values, that the participant selection criteria was approached strictly based on qualifying criteria that is relevant to the research question.

Engagement with diverse perspectives: the researcher actively sought out and considered perspectives different from their own. This included attending several conferences and making a presentation of the research methods in these conferences and incorporating feedback from academics. It also involved incorporating feedback from supervisors and other relevant academics.

Critical Friend: the researcher engaged an academic who is a work colleague with no interests in the research to regularly provide honest feedback and challenge the researcher's assumptions. This was in addition to the supervisory team.

Participant recruitment

Fifty-one companies from various sectors in Nigeria were contacted via company email with the aim of collecting data from at least 2 staffs (senior staffs and managers of logistics departments) from each company based on purposive sampling techniques. The target was to collect data from 102 participants using the foregoing method. This however did not yield any result. Also, industry associations representing various sectors were contacted alongside the 51 companies with the aim of using the help of these associations to obtain contacts of senior staffs and managers of the 51 companies based on snowballing sampling technique. This also did not yield any result. The third strategy was to contact logistics and transport associations in Nigeria with the aim of obtaining contacts of potential participants from the industries that they serve. This also did not yield any results. The fourth strategy was contacting family and friends to help with referrals of logistics personnels in any relevant company in Nigeria. The foregoing yielded results as the researcher obtained the contact of a logistics personnel from a family member. The logistics personnel referred the researcher to a senior staff of a third-party logistics company. Data was collected from the 3PL company through the senior staff. The 3PL senior staff also referred the researcher to two logistics personnels from two different agricultural companies both located in the northern part of Nigeria. It is important to note that none of the three respondents are friends and family members, but these were contacted through the referral of a family member which led to further referral. The researcher attempted to obtain data from additional staff of both the 3PL firm and the two agricultural companies but to no avail. The fifth strategy was to obtain contacts from Nigerian links associated with the researcher's academic supervisory team and University academic staff. This also yielded results, 3 participants were recruited

through this process from a large FMCG, a medium scale manufacturing company and a large pharmaceutical company. Table 4.5 lists the associations contacted and their sectors.

Table 4.5 below lists the associations that were contacted according to sectors:

Table 4.5: showing the associations contacted, their sectors and number of companies contacted within each association.

Sector/industry	Associations contacted	No. of member companies contacted
Food and beverage	1. Food and beverages West Africa. 2. Association of Food, Beverage, and Tobacco. 3. Manufacturers Association of Nigeria	10
Cement industry	Cement Manufacturers Association of Nigeria	6
Oil and gas	1. Independent Petroleum Marketers Association of Nigeria and 2. National Association of Petroleum Explorationists	8
Health and pharmaceutical	1. Association of Industrial Pharmacists in Nigeria (N.A.I.P) 2. Association of Pharmaceutical Importers of Nigeria (A.P.I.N) 3. Pharmaceutical Manufacturers Group of the Manufacturers Association of Nigeria (P.G.M-M.A.N.) 4. Association of Community Pharmacists of Nigeria (A.C.P.N) and	10

	5. Pharmaceutical Society of Nigeria (P.S.N).	
Hospitality and tourism	Nigeria Hotel Association	4
Retail	1. The National Association of Supermarket Operators of Nigeria (NASON) 2. Retail Association of Nigeria (RAN)	8
Transport and logistics	1. National Association of Nigeria travel Agencies. 2. National Association of Government. Approved Freight Forwarders. 3. Nigerian Association of Road Transport Owners. 4. Nigerian Ports Authority 5. Chartered institute of Logistics and Transport (CILT) Nigeria. 6. Africa Association of Professional Freight Forwarders and Logistics of Nigeria	0

Five small to medium enterprises (SMEs) from various sectors were contacted but no represented association was contacted as the SMEs belong to various sectors.

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Though the response from target participants is low, secondary data collected from the content analysis and from the correlation analysis were used to corroborate the external validity of the research. Also, the companies represented are all large corporations except one. The organisations are all engaged in heavy logistics activities, and they represent a substantial amount of logistics activities in the country. This is seen in table 4.6 below.

Table 4.6 below summarises the key characteristics of the organisations represented by the 6 participants:

Table 4.6: Summary of the key characteristics of participant organizations.

Participant organisation's sector	Core activity	Geographical location of participant	Geographical coverage of organisation	Level of logistics activity	Size of organisation
Third party logistics company	Providing third-party logistics activities to 500 companies in Nigeria	Kano state, North-Western Nigeria	All 36 states and the federal capital territory	Heavy logistics outsourcing activities	Large corporation
Pharmaceutical company	Manufacturing, distribution, and sales of medical drugs	Rivers state, South Southern Nigeria	24 states	Heavy logistics activities	Large corporation
Manufacturing company	Manufacturing and importation	Lagos state, Southwestern Nigeria	2 states	Heavy logistics activities	Medium sized company

FMCG	Manufacturing and retailing of fast-moving consumer goods	Lagos state, Southwestern Nigeria	All 36 states	Heavy logistics activities	Large corporation
Agricultural company	Produces a wide range of animal feeds & consumer products	Adamawa state, North-Eastern Nigeria	All 36 states	Heavy logistics activities	Large corporation
Agricultural company	Food and agri-business company supplies food and industrial raw material to companies	Adamawa state, North-Eastern Nigeria	All 36 states	Heavy logistics activities	Large corporation

Table 4.7 below shows the job position of the participants.

Table 4.7: outlines job positions of participants

Participant organisations	Participant job position
Third-party logistics firm	Senior staff member
Pharmaceutical company	Head of logistics department
Manufacturing company	Managing director
FMCG	Senior staff member of logistics department
Agricultural company	Senior logistics staff and supplier

Agricultural company	Senior logistics staff and supplier

As stated earlier, the research employs purposive sampling so that the participants are recruited because of their experience of the phenomenon under investigation as seen in table 4.7 above.

4.6 Research evaluation

4.6.1 Reliability

According to Collis and Hussey (2021) refers to how precise and accurate the results of the measurements are and if these results and conclusions can be replicated if the research is repeated with the same techniques or data. Bell et al. (2022) argued that reliability refers to the consistency and stability of the measures that have been applied. Such that if the same measures are applied to test concepts in business and management research on two or more occasions will the same results be obtained? Reliability is very important to positivists because one of the ontological assumptions of positivism is that there is only one true reality. Hence, the correct use of well structured, quantitative methods and techniques will always produce similar results if the measurements are repeated 100 times over. On the other hand, reliability is of little importance to interpretivists because one its ontological assumptions asserts that there are several realities, meanings, and interpretations of reality (Saunders et al., 2009; Collis and Hussey, 2021). In the case of pragmatic research, the reliability of a pragmatic research is based on the mixed methods approach which is often associated with pragmatic research. This is because the same or similar phenomenon of interest is investigated and tested multiple times using different and the results are the same, similar or corroborates each other. The foregoing is the one of the reasons why a pragmatic approach is adopted for this research which has employed mixed methods. The interpretivist approach is not wholly adopted for this research nor is the positivist approach however elements of the interpretivists approach such as qualitative data collection methods of semi-structured

interviews, qualitative content analysis and thematic analysis are used in this research. Also, elements of the positivist approach such as quantitative data collection methods of structured interviews and Likert scale questionnaires, and correlation analysis and statistical t-test. Hence, the research adopted a pragmatic approach with mixed methods. The various methods were used to investigate the same phenomenon and yielded similar results hence establishing the reliability of this research's approach. The interpretive methods of content analysis, semi-structured interviews and thematic analysis have been widely used by scholars as it provides a richer insight and understanding of the phenomenon under investigation hence its adoption (Collis and Hussey, 2021; Bell et al., 2022).

4.6.2 Validity

Bell et al. (2022) noted that the concept of validity of measures deals with whether the measures actually measure the concept under investigation. Though, both reliability and validity deal with whether the measures are correct for the research however, while reliability deals with the stability and consistency of the measures, validity deals with whether the measures are right for the job (Bell et al., 2022). In other words, research validity deals with whether the measures actually measure the concept in the first place or whether it is measuring something else unlike reliability which is concerned with whether the results of the measurements are the same always.

4.6.3 The logic of triangulation

As stated earlier, the reliability and validity of a pragmatic research is based on the use of mixed methods where the same or similar phenomena of interest have been investigated multiple times using different methods. As Bell et al. (2022) argued that one method of testing the reliability or consistency of a measurement is to test the concept or phenomenon under investigation and to retest it again. Bell et al. (2022) noted that the logic of triangulation in mixed methods research implies that the findings of an investigation employing a method associated with one research strategy such as quantitative research is cross-checked against the findings of same or similar investigation using a different method

associated with the other research strategy such as qualitative research. The foregoing demonstrates that the findings of the phenomenon under investigation is not a product of a specific method as the findings of the quantitative method is the same, similar or corroborates with the findings of the qualitative method.

In the case of this research, all five objectives were met using different methods from both the interpretivist and positivist paradigm. Investigation into the practice of logistics outsourcing in Nigeria were found to yield similar results in the content analysis, statistical t-test, the deductive thematic analysis and the correlation analysis all of which showed that basic logistics activities such as transportation and distribution management (including last mile delivery) are most outsourced in developing country contexts such as Nigeria and that the socio-economic and infrastructural limitations prevalent in Nigeria affects and influence the outsourcing decision. The findings made through the correlation analysis and statistical t-test both quantitative research corroborates with the findings of the content analysis and thematic analysis to produce the final conclusions of the research. Hence arguments were made objectively using different methods thereby achieving method triangulation and establishing the validity and reliability of the research process. The method triangulation of this research demonstrates that the process is reliable as the same or similar results were obtained at different times using different methods. It also demonstrates that the process is valid as the multitude of methods that were used yielded similar results hence enabling conclusions and inferences to be made. The foregoing therefore indicates that the pragmatic approach taken towards this research is the right approach for the job. In meeting each objective of this research, research questions were raised to guide the line of inquiry, and different methods were used to answer each research question with each finding corroborating the findings of the other and all together meeting the research objectives. This is well laid out clearly in the conclusion chapter in section 5.2.1. Section 5.2.1 clearly lays out research objectives one to five and lays out the mixed methods that were used to achieve

each objective and how the findings from one method corroborates with the findings from the other method(s) to achieve each objective, see section 5.2.1.

4.6.4 Generalizability

Collis and Hussey (2021) noted that generalizability deals with the degree to which the research findings (usually based on a sample) can be applied to other cases or settings with similar characteristics with the sample (usually referred to as the population). In the case of this research, generalizations were not made as the research conclusions are exploratory and not confirmatory. The findings of the research are presented as hypothesis upon which future confirmatory research can be made. The purpose of this research does not require confirmation of hypothesis testing (like a deductive/positivist research) because it is still a virgin area hence the research seeks to explore first. The research also does not seek to generalise the findings of the Nigerian case study to similar developing countries (like an inductive approach) as this is not the aim of the research. However, the findings from the multiple case studies (i.e., company cases) were extended to the population, which is the sectors that they belong, and all together were extended to the entire Nigerian logistics market but tentatively.

4.7 Explanation of the stages of research activities

4.7.1 Literature review

. An extensive literature review which explored the various areas, branches, theories and definitions of logistics and supply chain management, logistics strategies such as lean, just-in-time and agile, supply chain and third-party logistics performance metrics, third-party logistics selection decision support framework, outsourcing, theories of outsourcing and third-party logistics, types of third-party logistics contractual arrangements and relationship management, general problems, challenges and risks associated with third-party logistics was done. These topic areas were reviewed to establish the general literature on the topic of interest which is logistics outsourcing. The practice of logistics outsourcing in developed countries was also reviewed.

The literature review further studied various areas of the practice of logistics outsourcing in developing countries to give an idea of the differences in the levels of logistics outsourcing between developed regions and developing countries. Also, to highlight what the practice of logistics outsourcing is like in other developing countries relative to Nigeria.

The literature review further reviewed literature about third-party logistics practice in Nigeria and aimed at identifying gaps from the literature. It also reviewed key areas that are very specific to the topic of interest such as importance of logistics outsourcing and the risks of keeping it in-housing, reasons for the differences in the levels of logistics outsourcing between developed and developing regions, importance of using an effective third-party logistics decision support framework and the risks of its absence, academic papers that acknowledge the dearth in research of third-party logistics in developing countries, in Nigeria and academic papers that studied third-party logistics in Nigeria but focused on one particular sector. The identified gaps are summarised below:

- The identified gaps include the dearth of research in logistics outsourcing in developing countries and Nigeria.
- The dearth of a multi-sectoral research in logistics outsourcing in Nigeria and
- Dearth of research into individual logistics outsourcing activities such as warehousing, inventory management in Nigeria. The subsequent research activities attempted closing the identified gaps.

4.7.2 Content analysis

As stated earlier, a comparative content analysis was done to demonstrate variation by looking at the differences in the practice of logistics outsourcing between Nigeria and a developed country such as the UK representing a matured market. According to Bell et al. (2022), content

analysis involves identifying patterns or meanings by an analyst through active engagement with data and classifying these patterns into themes. Hence, content analysis according to Bell et al. (2022) essentially involves searching for themes. Bell et al. (2022) further noted that themes relate to the researcher's research focus and by extension the research questions. In other cases, it also builds on the researcher's familiarity with the data including initial codes identified in the transcript or field notes. Bell et al, (2022) further argued that themes provide the researcher with basis for understanding the data which can enable theoretical contribution to the body of knowledge relating to the research focus.

The content analysis reviewed various kinds of secondary data sources identifying similar and repeated barriers and challenges to logistics outsourcing in the UK and Nigeria and classifying these into themes and sub-themes and ranking them in order of importance according to their frequency of occurrence in the secondary data. The themes which were ranked according to frequency of occurrence was used to obtain data that was used to develop the decision support framework and in developing the proposed theory. The content analysis was also a method of analysis that was used to answer some of the research questions and therefore part of the research process. The content analysis was also a data analysis technique as secondary data generated through various data sources were analysed by thematically and ranking based on the frequency of occurrence. The process of the content analysis is explained below:

Database search: ABI/INFORM complete database was the main database used to search for academic papers and reports from newspapers and magazines. Advanced search was used and search words such as "UK AND third-party logistics industry" "Nigeria AND third-party logistics industry" "Nigerian 3PL AND market report" "UK 3PL AND market report" "logistics outsourcing AND Nigeria" "logistics outsourcing AND UK" was used. The search generated over 130,918 papers and after inclusion and exclusion criteria were used, 40 papers were selected.

The 40 papers included 24 academic journal and conference papers while 16 were online newspapers and magazines. The inclusion and exclusion criteria are laid out in table 4.8 below:

Table 4.8: content analysis inclusion and exclusion criteria.

Criteria	Inclusion	Exclusion
Geographical location	UK and Nigeria	Any country other than the UK and Nigeria
Date of publication	Between 1990 and 2020	Publication older than 1990
Language	English	Any other language
Relevance to search words	Any search word found in the title, abstract, executive summary, or introduction	If search word is not found in title, abstract, executive summary, or introduction

Special databases: GMID (General Market Information Database) and World Bank database were used to obtain insights, statistics, and quantitative data about logistics performance indices in the UK and Nigeria which were included in the analysis.

Special websites: Statista, Armstrong & Associates, Mordor Intelligence, Mintel, Ibis World and Report Linker websites were also used to obtain insights, quantitative data, and statistics about the third-party logistics market in the UK and Nigeria.

Special industry reports: special industry reports were included in the analysis such as UK logistics report by Freight Transport Association (FTA), UK logistical services report by Mintel, UK third party logistics report by SCALA consulting, Nigeria third party logistics market report and forecast by Mordor Intelligence and Nigeria logistics risks quarterly reports by BMI Research the Fitch Group company.

The sequence of activities conducted during the content analysis are outlined in table 4.9 below:

Table 4.9: Content analysis sequence of activities.

Stage	Activity
Stage one	Data base search
Stage two	Apply inclusion and exclusion criteria
Stage three	Choose final reports and include data from special database, special websites, and special industry reports
Stage four	Review all reports and data identifying the barriers and challenges
Stage five	Rank the barriers and challenges based on frequency of occurrence in the data and create sub-themes from them
Stage six	Create broader themes from the sub-themes
Stage seven	Rank the broad themes
Stage eight	Compare the results of the Nigerian case study with the results of the UK case study

Creating themes

The research reviewed all secondary data obtained from the various sources as mentioned above first, in the case of the UK and then Nigeria. After each review, the barriers and challenges facing the practice of 3PL in each country are listed in a table. The context in which the issues were identified was also summarised in the table. Sub-themes that are based on the context in which the issues were identified in the data are also listed in the table. The sub-themes are phrases or words that describe in summary important concepts found in the data relevant to answering the research questions and meeting the research objectives (Bell et al., 2022). Then themes were created from these sub-themes (Bell et al., 2022) representing patterns and similarities that were identified in the data and that are commonly categorized under a common topic of interest (Bell et al., 2022).

Ranking

The themes were then ranked in order of priority or importance according to frequency of occurrence. The ranking was done first by listing the issues and their sub-themes in the UK case that was found in the literature and ranking the issues in the order of 1 as highest and 6 as lowest based on their frequency of appearance in the literature. Then in the Nigerian case, the issues and their sub-themes that are identified in the literature were also listed in a table and ranked in the order of 1 as highest and 22 as lowest based on the frequency of appearance in the literature. The themes in both cases were then identified in a second and third table based on associated sub-themes. First in the case of the UK and then the Nigerian case. Then a fourth and fifth table ranked the themes in both cases, first in the UK case and then the Nigerian case according to order of importance based on the frequency of occurrence of the themes as identified by the sub-themes.

A comparison was then made in a free flow discussion comparing and contrasting the results from the Nigerian case study with the results from the UK case study.

4.7.3 Difference between the literature review and the content analysis

Table 4.10 below shows the difference between the literature review and the content analysis:

Table 4.10: Difference between the literature review and content analysis

Criteria	Literature review	Content analysis
Purpose	Review previous literature relevant to the topic and identify gaps. Part of the research process	Generate data for the decision support framework and theoretical proposition and analyse data. Also, part of the research process

Method	Review of academic literature and other secondary data sources but mainly academic literature in three stages. Exploring the topic area and identify gaps in knowledge and practice but absence of data analysis	Review academic literature and other secondary data sources. Obtain secondary data, analyse these data by identifying patterns and similarities in the data which identifies barriers and challenges under specific themes and ranking these themes according to frequency of occurrence in the data

4.7.4 Primary data collection

As explained above, secondary data both was obtained through the content analysis. Also, further secondary data was obtained through databases such as World Bank database and Armstrong and Associates for the correlation analysis. Data collected for the correlation analysis are quantitative data only.

After the content analysis was completed, next was primary data collection. A mixed method of data collection was applied. Hence, both quantitative and qualitative methods of data collection were used. This section focuses on primary data collection using both qualitative and quantitative methods. The qualitative method includes semi-structured interviews while the quantitative methods include structured interviews, structured questionnaires, and Likert scale questionnaires. The data collection using quantitative method only represents expert opinions and their attitudes towards aspects of logistics outsourcing. It does not contain quantitative records of logistics events and company financial records as these are not required to achieve the aim and objectives of the research and are not readily obtainable.

Structured interviews

According to Collis and Hussey (2021) structured interviews are from the positivists paradigm and they are closed questions which usually require a quick response such as a 'yes' or 'no' or a very brief factual answer or a list of predetermined answer from which the interviewee is expected to choose. Collis and Hussey (2021) further noted that structured interviews which are usually employed in a quantitative research are pre-prepared or planned in advance and each interviewee is asked the same questions in the same order (Bell et al., 2022). Bell et al. (2022) noted that structured interview is usually non-flexible in order to standardize the way in which the interview is dealt with. In contrast, unstructured interviews are usually flexible. Structured interviews are non-flexible and standardized because the questions are linked and relevant to the overall research questions and the aim of investigation (Bell et al., 2022). Structured interview was employed in this research to gain specific information relevant to answering the research questions such as what the organisation's core activity is. Structured interview was used first as a background or pre-set of questions before the questionnaires the Likert scale questionnaires were employed. This gave the researcher a more contextual understanding of the logistics outsourcing situation of each participating organisation. The questions are short questions requiring short factual answers about the organisation and its logistics activities or a yes or no answer about the organisation's logistics outsourcing journey. The areas of focus during the structured interview are as follows:

- Geographical coverage of the organisation among the 36 states in Nigeria
- The organisation's core business activity requiring short factual answer
- What level of logistics activity the organisation is involved in with predetermined answers
- If the organisation is involved in logistics outsourcing requiring yes or no answer and how long that has been which requires a figure as answer

- If there has been breaks in the organisation's logistics outsourcing journey which requires a yes or no
- If the organisation is outsourcing all its logistics activities or some and if some, which of the logistics activities are outsourced both of which requires short factual answers

The interviews were very short, averagely 10 minutes and some of the information gathered was analysed using descriptive statistics such as mean, and the results were used in the discussion section of the analysis chapter.

Likert scale questionnaires

A Likert scale is a rating scale that quantitatively assesses opinions, attitudes, or behaviours and this was used to collect data from the respondents (Gorman and Macintosh, 2014). Often associated with positivists paradigm, it usually consists of four or more questions that is aimed at measuring a single attitude or trait when response scores are combined and compared (Gorman and Macintosh, 2014). According to Collis and Hussey (2021) Likert scale is an example of an intensity rating scale as they are often used in a multiple-item measures of attitudes which allows respondents to give a more discriminating response and allows room for neutrality or a middle point. Likert scale questionnaire was used to enable the data from participants to be analysed using statistical techniques such as t-test and descriptive statistics.

The data obtained are both interval and ordinal data. In the case of interval data, variables were grouped into categories using ordered scale and the interval values were ordered and separated using an equal measure of distance (Zikmund et al., 2010). On the other hand, the ordinal data were grouped into categories and ranked orderly with each category numbered but without a clear equal measure of distance between each point (Zikmund et al., 2010). The Likert scale questionnaires with ordinal data had five points scale with a mid-point that was associated with neutrality of opinion while the Likert scale questionnaire with interval data had four-point scale without a mid-point.

The questionnaire has four sections two of which are Likert scale with interval scales and the other two are Likert scale with ordinal scales. These four sections are named as follows:

- Level of logistics outsourcing (interval scale),
- Logistics outsourcing and business performance (ordinal scale),
- Logistics outsourcing and cost efficiency (interval scale), and
- Logistics outsourcing and the use of modern technologies (by 3PLs) and its effect on operational efficiency and customer satisfaction (ordinal scale).

Questions were asked around these areas to gather data that will enable the researcher to meet the research objective three. Objectives one, two and four are met through data collected from content analysis, semi-structured interviews and through the decision support framework respectively. These objectives are clearly laid out in chapter one. The inclusion of the impact of 3PL modern technology on operational efficiency and customer satisfaction is informed by emphasis made in the literature on the effectiveness of 3PL IT capabilities or outsourcing IT functions in achieving efficiency and customer satisfaction (Jain et al., 2022; Awe et al. 2018; Solakivi et al. 2011).

The reason for using interval scale to investigate the level of logistics outsourcing is because the response from the experts requires an indication of quantity or amount. Though this is not based on factual company records but rather based on the experiential opinions of the expert, an indication of the amount or percentage of total warehousing or transportation and distribution was required to give the researcher an idea of how much of each logistics activity is outsourced and how much is kept in-house. Hence, ordinal scale was required, and the data obtained was treated as percentages showing how much percentage of each logistics activity was outsourced and how much percentage was kept in-house.

Logistics outsourcing and business performance employed the usual ordinal scale associated with Likert scales because the research only required the opinion of experts and does not

require an indication of quantity or amount. Hence, the Likert scale questionnaire measured each expert's perception towards the impact of logistics outsourcing on the business performance of their organisation represented. Unlike the interval scale with equal distance between each point, the ordinal scale does not have an equal distance between each point hence there was an option for neutrality, which was associated with the mid-point. The mid-point indicated that expert's opinion was not leaning towards the extremes of either side hence why it is the median of the five-point Likert scale.

Again, interval scale was used to measure the expert's opinion towards logistics outsourcing and cost savings and this required a measurement of amount. This means that the Likert scale questionnaire aimed at giving the researcher an idea of how much cost savings was achieved in each logistics activity by reason of outsourcing. Again, this is not based on factual company records but based on expert's opinion of how much cost savings they think logistics outsourcing is making compared to the estimated costs of keeping the logistics activities inhouse. Again, the data obtained was treated as percentages showing how much percentage cost savings is made while outsourcing each logistics activity compared to the costs of keeping the logistics activity inhouse.

Logistics outsourcing and the use of modern technologies (by 3PLs) and its effect on operational efficiency and customer satisfaction was again only based on expert's opinion and does not indicate quantity or amount hence ordinal scale was used. Just like logistics outsourcing and business performance, an option of neutrality associated with the midpoint was available though none of the respondents indicated a neutral position in this case.

All the questionnaires were distributed to participants via email.

Semi-structured interviews

After the questionnaires were returned, semi-structured interviews were conducted as a follow-up investigation to gain richer understanding of the situation beyond the insights garnered from the questionnaire.

According to Collis and Hussey (2021), semi-structured interviews are often structured, pre-prepared or planned in advance just like structured interviews. Semi-structured interview questions are also often asked in the same order to the different interviewees. However, unlike structured interviews, semi-structured interviews questions are often open-ended and flexible. Hence, the researcher may ask an unplanned follow-up question from the previous questions and in some cases all pre-planned questions may not be asked as some of them may have been answered from one of the previous answers given by the interviewee (Collis and Hussey, 2021). Therefore, semi-structured interview just like unstructured interview often seek the opinion of the interviewee in order to understand the situation in a more detailed way or manner (Bell et al., 2022). However, the answers are usually not quick and short unlike structured interview. Semi-structured interview is associated with the interpretivists research paradigm. This method of data collection was employed in this research to gain further detailed and contextual information after the quantitative data had been collected. It was also collected to further understand the participant's opinions, views, and attitudes towards logistics outsourcing. The semi-structured interview was also used as follow-up questions to some of the quantitative data previously collected in order to gain a richer understanding of the situation.

The interviews were conducted through WhatsApp phone call and key point were jotted as interview minutes. There was no agreement between the researcher and the interviewee on the duration of the interview however the interviews duration was an average of 30 minutes.

Of the 6 respondents, only 4 were available to participate in the semi-structured interviews. These 4 include:

- The participant from the pharmaceutical company
- The participant from the agricultural/food company
- The participant from the agricultural company
- The participant from the third-party logistics company

4.7.5 Data analysis techniques

Descriptive statistics

Next after the primary data collection, data analysis commenced. As stated earlier, descriptive statistics was employed to demonstrate differences in the data. This was done by using charts to demonstrate frequency distribution of numerical values first among the variables (logistics activities) and second among the sectors. The various descriptive statistical techniques commonly used by scholars are measures of dispersion- range and standard deviation, measures of normality- skewness and kurtosis, frequency distribution- bar charts, column chart, pie charts, pivot charts and measures of central tendency- mean, mode and median (Bell et al., 2022).

Frequency distribution techniques such as bar charts, column charts, pie charts and pivot charts and measures of central tendency such as mean, and mode were used in this research in order to summarize and show the frequencies for all the numerical values in a specific variable (Collis and Hussey, 2021). For example, the pivot chart showed that inventory management and order management both had the highest count of zero values showing the mode of distribution. Also, column and bar charts were used to show difference and make comparison in the data. For example, clustered column chart in the level of logistics outsourcing section showed that FMCG had the highest number of 100% level of logistics outsourcing compared to other sectors represented. Other charts that were used include pie charts which was used to demonstrate the percentage share of each logistics activity in a particular sector. Charts were used instead of

percentage frequency because the data set is small hence charts are more suitable as it makes the data sets easier to compare and it is easier to communicate general points about the data set. Charts also show any relationship or difference in the data set more clearly which enhances comparison (Collis and Hussey, 2021).

As noted, earlier information collected from the structured interview were assigned numerical values and analysed by obtaining the mean values from each question.

Also, all four sections of the questionnaires as listed above were analysed using descriptive statistics to gain insights into the data such as the mean value of each logistics activity in the *level of logistics outsourcing* section. They were also analysed using descriptive statistics to give some insights such as showing which sector outsourced more of a particular logistics activity, which logistics activity had the most zero value (indicating zero outsourcing) in the *level of logistic outsourcing section.* Also, which sectors had the most similar numerical values in each section and which logistics are most and least outsourced in the *level of logistics outsourcing* section. Further details are in the analysis chapter. The first section (levels of logistics outsourcing) was then further analysed using statistical t-test for test of difference among the various logistics activities to determine if the difference in the mean of each outsourced logistics activity is statistically significant. This is explained further in the statistical t-test section.

All four sections were also used in a free flow discussion where the data was directly compared with the literature review findings and the thematic analysis of the semi-structured interviews.

The charts were generated in excel with detailed explanations of the charts in the analysis, results, and discussion chapter.

Statistical t-test

A statistical t-test was done after the descriptive statistical analysis. The statistical t-test was used as a test of differences between the various outsourced logistics activities to determine if the difference in the mean value $\dot{X}$ of the various outsourced logistics activities is by chance or if there are statistically significant (Collis and Hussey, 2021). Statistical significance refers to when the differences in the mean values are not by chance or some factor of interest but have enough confidence level to prove that they are true beyond doubt. Hence, the p value at 0.05 gives 95% confidence level that the results are true and not by coincidence, hence rejecting the null hypothesis that there is no difference. Therefore, the null hypothesis (zero difference in mean values) is represented by $H_0: \mu = \dot{X}$ while the alternate hypothesis (statistically significant or different) is represented by $H_1: \mu \neq \dot{X}$. This is explained in detail in the analysis, results, and findings chapter.

The statistical t-test therefore compared the data representing the logistics activities between each other. The comparison therefore determined if the results of the descriptive statistics showing which logistics activity is more outsourced than the other is statistically significant. The comparison also determined if the results of the descriptive statistics showing which logistics activity is most outsourced and which is least outsourced is statistically significant.

The statistical t-tests were done using excel software. Again, as stated earlier, t-test was used because the data sample is small.

Correlation analysis

Correlational analysis was carried out after the statistical t-test. Correlation analysis is a quantitative method used to evaluate the strength of the relationship between two quantitative or quantifiable variables. The result may be a no relationship at all which means no form of relationship exists. The results may also be strong or weak indicating either a strong relationship or that the variables are hardly related respectively (Cohen et al., 2013). Collis and Hussey

(2021) noted that correlation analysis is a test of association between variables that measures the direction and strength of any linear relationship between the variables. Colls and Hussey (2021) further noted that majority of the statistics employed in social science studies such as business are done based on straight-line or linear models.

Correlation coefficient refers to the measure of the linear dependence that a random numerical variable has on another (Collis and Hussey, 2021). The measured variables are not tested for a cause-and-effect relationship hence they are not referred as dependent and independent variables. “The correlation coefficient is measured within the range of -1 to +1” (Collis and Hussey, 2021, pg.251). The correlation direction is positive when the variables increase or decrease together and negative when one variable increase and the other variable decrease. Collis and Hussey, (2021) further argued that the correlation strength is determined by the size of the correlation coefficient as stated below:

1 means that there is a perfect positive linear correlation or association.

0 means that there is zero linear correlation or association.

-1 means that there exist a perfect negative linear correlation or association.

There is various grading therefore for values in between the above stated sizes of correlation coefficient and they are summarized in table 4.11 below:

Table 4.11: Grades of correlation, Source: (Collis and Hussey, 2021)

No.	Correlation coefficient values	Grades
1	From 0.90 to 0.99	Very high positive correlation
2	From 0.70 to 0.89	High positive correlation
3	From 0.40 to 0.69	Medium positive correlation
4	From 0 to 0.39	Low positive correlation

5	From -0 to -0.39	Low negative correlation
6	From -0.40 to -0.69	Medium negative correlation
7	From -0.70 to -0.89	High negative correlation
8	From -0.90 to -0.99	Very high negative correlation

Collis and Hussey (2021) further noted that in the case where the data is parametric, a correlation relationship can be determined at a preliminary stage by plotting spots in a graph showing where each value is located in the graph. The foregoing is referred to as simple scatter plot. One variable is plotted against the other on the y and x axis to determine if there is a pattern in the plot. The pattern of points in the graph and the extent to which it is clustered around a straight line shows the direction and strength of any possible linear correlation or association respectively. Hence, the foregoing can show if there is a positive if the plots is clustered from the lower left to the upper right and negative if the clustering runs from the upper left to the lower right. Then when the plots are clustered randomly with any pattern there is no relationship. Also, if the plots are not clustered within a straight line but indicates clustering along a zig zag lines then there is a possible non-linear correlation.

Correlation analysis was used to test if there is an association between economic development and level of logistics outsourcing. Gross National Income (GNI) per capita which refers to all goods and services produced in a country in a year plus receipts from nationals who live outside the country divided by the population was used to represent the level of a country's economic development (World Bank, 2023). The World bank use the GNI per capita to categorize countries into high income, middle income, and low-income countries. The GNI per capita of countries of developed and developing countries were used as variable representing economic development. Hence, countries in the high-income category were selected to represent developed countries while countries in the middle- and low-income categories were selected to

represent developing countries. The middle-income category is divided into upper and lower by World Bank and both categories were used to represent developing countries alongside low-income countries. This is also explained in the analysis chapter. The 3PL revenues as a percentage of logistics cost of these countries were used as a variable representing the level of logistics outsourcing. The data on 3PL revenues were obtained from Armstrong and Associates' (2022) report on global third-party logistics. Also, correlation analysis was used to test if there is an association between economic development using GNI per capita as variable and logistics operations efficiency using logistics cost as a percentage of GDP obtained from Armstrong and Associates (2022) as variable.

The foregoing tests were performed to show the extent to which there are limitations to the level of logistics outsourcing in a country based on the country's level of economic development. These limitations have been investigated in the comparative context analysis of the barriers, challenges and problems of logistics outsourcing between Nigeria and the UK however the correlation analysis is another method of demonstrating the impact of economic development on logistics outsourcing and putting these together in the discussion chapter thereby triangulating data and increasing the validity and credibility of this research findings. Also, the correlation analysis was also conducted to test whether logistics cost efficiency of organisations (as a country's aggregate logistics efficiency is gathered from individual logistics costs of companies) is correlated with economic development and this again aims to demonstrate limitations of logistics outsourcing impact on organizational performance because of the already existing limitations to cost efficiency in developing countries. Hence, a tentative theory is built which assumes that part of the reasons for the lower practice of logistics outsourcing in developing countries is because of the existing limitations to the intended business performance outcome of logistics outsourcing such as cost efficiency and business performance. These limitations are a result of socio-economic developmental issues in developing countries. Hence, the theory

postulates that in developing countries where logistics operations are generally less cost efficient, organisations tend to be more conservative towards outsourcing logistics activities to control these activities more efficiently and effectively and mitigate risk. The foregoing theory can be examined or tested in a further study in Nigeria using deductive logic and a confirmatory approach. Third, the correlation analyses were done as part of a method of benchmarking the Nigerian third-party logistics market against the developed market context. This is explained in specific terms in the analyses chapter.

Thematic analysis

After the correlation analysis, thematic analysis was employed to analyse the data obtained from the semi-structured interviews. As mentioned earlier the content analysis was analysed by identifying patterns or meanings in the review of secondary data sources and these were classified into themes and ranked in order of importance according to their frequency of occurrence (Bell et al., 2022). Similar approach was adopted for analysis of the data from the semi-structured interviews. Information was recorded during the interview by notes made by the researcher. Recordings were not done electronically as there was no consent from the participants for electronic recording. Hence, information obtained from the researcher's notes were analysed by identifying repetitions, patterns, and similarities. These were identified and classified as themes. Furthermore, different words that are related to a particular topic are coded and categorized into one theme (Bell et al., 2022; Gorman and Macintosh, 2014; Zikmund et al., 2010). However, unlike the content analysis, in analysing the data from the semi-structured interviews, the researcher already had preconceived themes to look for based on the literature review, the findings of the content analysis, the findings from the descriptive statistical analysis and the findings of the correlation analysis. Hence, these findings generated preconceived themes with which the researcher looked for and identified from the researcher's semi-structured interview notes. These themes were then applied in the discussion of the

research findings comparing and relating them with other findings of the research upon which conclusions were drawn.

4.7.6 Decision support framework

The decision support framework is the main outcome or output of this research. The aim of the decision support framework is to provide a tool that can serve as a guide in helping companies in Nigeria to decide whether to outsource or not based on it benefits. It can also guide companies that are currently outsourcing some of their logistics activity in deciding whether to further outsource. Third, it may also be useful in helping companies to decide which logistics activities that are more beneficial or profitable for a particular company to outsource. A decision support framework refers to a system or structure that is used to support decision making (Jovcic et al. 2019).

4.7.6.1 Example

Decision support frameworks are not new in the third-party logistics literature, many scholars have used different decision support frameworks to support organizations in making decisions on evaluating and selecting a suitable third-party logistics firm. Some of these frameworks are highlighted here to support the external validity of the approach taken to develop this decision support framework. The process of the proposed decision support framework and how it works is similar with the process of the decision support framework developed by Jovcic et al. (2019) for evaluating and selecting third-party logistics companies. The framework developed by Jovcic et al. (2019) like most others in the third-party logistics literature are usually based on a fuzzy logic multicriteria decision making evaluation. A fuzzy approach is based on the observation that organizations can make decisions on imprecise or partial truth (Jovcic et al. 2019). In the case of Jovcic et al. (2019) Fuzzy logic which is usually used with analytic hierarchical process (AHP) was used with the input of expert opinion. The foregoing is usually referred to as fuzzy analytical

hierarchical process (FAHP). Expert opinions and extensive literature review was used by Jovcic et al. (2019) to establish the criteria and parameters or sub criteria (Qureshi, 2022). These was then assessed and analysed by FAHP to determine which criteria is more important. This was done by analysing the multicriteria to establish which of these criteria are the most important so that the multicriteria can be ranked accordingly. Weights were then assigned to each criterion in the process of analysis and ranking using FAHP (Jovcic et al., 2019).

Another popular method that is used by scholars along with FAHP and was used by Jovcic et al. (2019) to develop a decision support framework is the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) method (Qureshi, 2022). After the criteria were established and ranked using literature review, expert opinion and FAHP, data was collected from selected 3PL companies being considered for logistics outsourcing contract. The requested data from selected 3PL companies was based on the established multicriteria, and sub-criteria. The data from the 3PL companies were then analysed using TOPSIS method to determine which 3PL company is closest to the ideal solution and which 3PL firms are closest to the anti-ideal solution (Jovcic et al., 2019). The 3PL companies are then ranked according to the result of the TOPSIS analysis. Figure 2 below lays out the steps that have been discussed above to propose the multicriteria decision support framework for selecting third party logistics firm based on fuzzy analytical approach using AHP and TOPSIS methods by Jovcic et al., (2019):

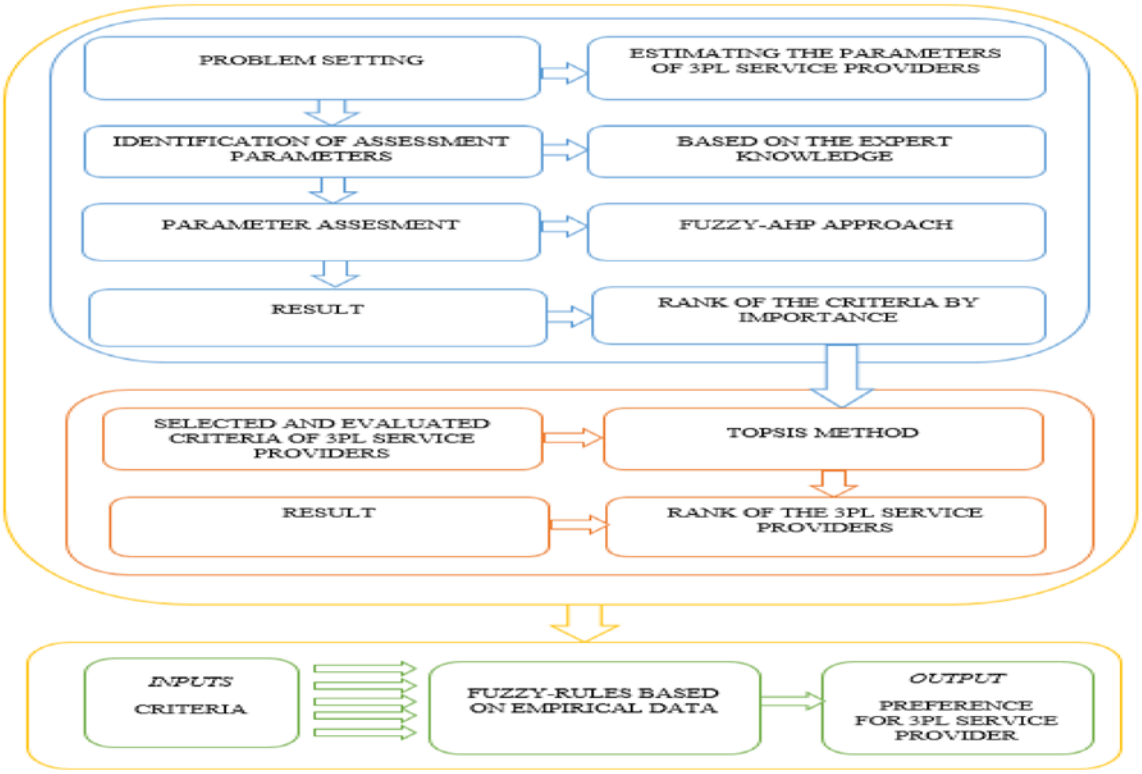


Figure 4.2: Process and steps used by Jovcic et al. (2019)

Figure 4.3 below shows an example of multicriteria and parameters (sub-criteria) which was used by Jovcic et al. (2019):

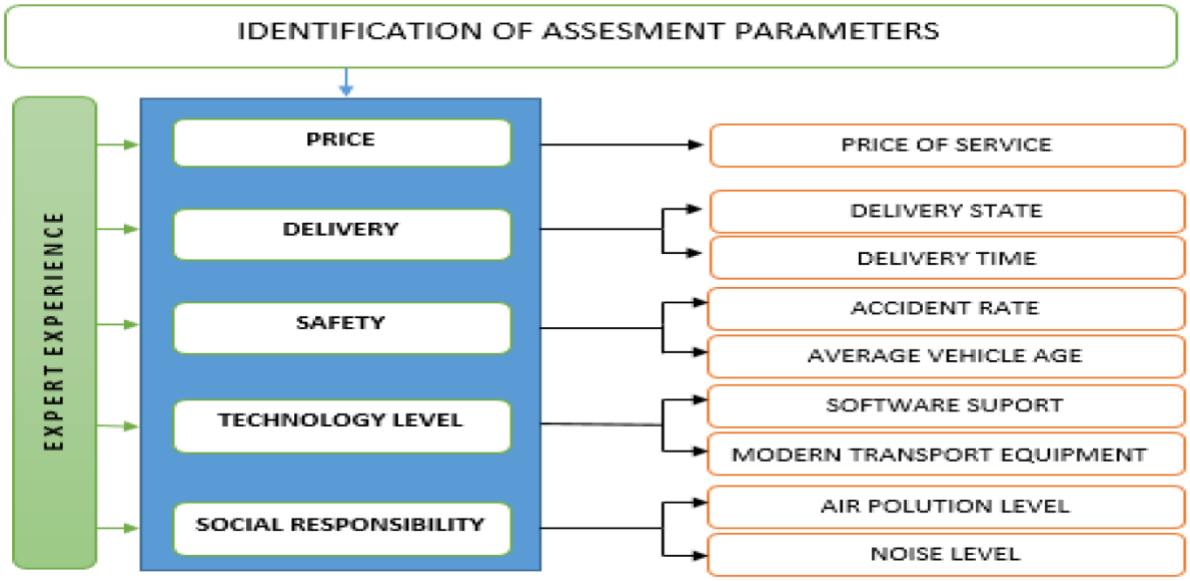


Figure 4.3: Multicriteria and sub-criteria used by Jovcic et al. (2019)

4.7.6.1 Other examples

Other tools that have been widely used by scholars include Data Envelopment Analysis (DEA). Similarly, to FAHP/TOPSIS framework and similar to the weighted scores, criteria, ratios, and traffic light system adopted by this research to develop this framework, DEA is used along with multicriteria approaches such as TOPSIS by scholars to determine which third-party logistics firm is most suitable for selection (Eydi, and Rastgar, 2022). DEA using data from an organization compares decision making units (DMUs) of an organization to establish which DMU is most efficient based on established criteria. Hence, data is collected from multiple 3PLs against established multicriteria informed by literature and expert opinion. These 3PLs' DMUs are then analysed using DEA based on data collected to establish which 3PL have the most efficient DMUs that correlates with the criteria (Esra and Ayşegül, 2016). TOPSIS is then used to rank the 3PLs that are maximally efficient (Haldar et al., 2017).

Other methods that are used include Decision making trial and evaluation laboratory (DEMATEL), Evaluation based on distance from average solution (EDAS), Interpretive ranking process (IRP), Organizational effective model (OEM), Evaluation by an area-based method for ranking (EAMR), Analytic network process (ANP) and Best-worst scaling approach based on Discrete choice analysis (Govindan et al. 2016; Esra and Ayşegül, 2016; Ecer 2018; Narkhede et al. 2017; Akaaboune et al. 2018; Karbassi-Yazdi et al. 2018; Coltman et al. 2011).

4.7.6.2 Frameworks differentiated by purpose

These techniques are combined by scholars to develop and propose a framework suitable for selecting third party logistics firms in different contexts such as for reverse logistics (Meade and Sarkis, 2002). The chosen methods and ingredients that are combined to develop the framework reflects the purpose and objectives of the framework as.is the case with this framework.

Mello et al. (2008) argues that while traditional 3PL selection prescriptive models and frameworks have been developed by many scholars in the past which are mainly based on traditional systematic, proactive, strategic-competence-driven processes, other scholars have observed that in reality most firms have made their 3PL selection decision based on local, reactive, ad-hoc (specific to the immediate business needs), and relatively limited-strategy-driven processes. The findings of their study further suggest that theoretically while the traditional prescriptive models have provided cognitive approaches to choosing a 3PL provider, companies have in actual sense used both cognitive and experiential search and evaluation to make 3PL provider selection decisions. It is that experiential expert opinion and evaluation that form the basis for this research's decision support framework. Furthermore, the purpose of this framework is different from Jovcic's framework and most other frameworks which explains why the ingredients that make up this framework is somewhat different howbeit the process is similar.

The techniques and tools that were mentioned above have been put together to propose decision support frameworks that are used globally to guide companies in selecting a suitable third-party logistics firm however they have not been useful in helping companies to decide whether it is profitable to outsource or not as this is not the purpose of these tools and frameworks. Hence, a decision support framework that helps companies decide whether it is profitable to outsource or not has rarely been proposed in the literature creating the need to propose one. The foregoing shows that this is a relatively virgin area of research interest hence further justifies the exploratory nature of this research and the need to employ an abductive approach (Collis and Hussey, 2021; Bell et al., 2022).

As mentioned earlier, the decision support framework proposed by this research followed the process of most framework in the literature particularly the process followed by Jovcic et al. (2019). The process and how the framework works is explained below:

- Overall, the criteria for deciding to outsource is based on weighted scores and ratios which determines the organisation's decision to outsource or not in a traffic light manner.
- Hence, the cost-benefits analysis concept is implemented in this framework using weighting and traffic light method.
- **The process begins**: A list of potential costs/risks and benefits are established and laid out based on the literature review, content analysis and expert experiential opinion.
- Set of scores are allocated to the potential costs/risks and benefits/rewards according to the importance of each (weighting). Hence, the scores are not distributed equally to the variables and factors under the cost-benefits categories but according to the importance of each.
- The importance (that is the weighting), attached to each risk/cost or reward/benefit is established based on the findings drawn from the literature review and content analysis.
- Scores are awarded to costs/risks and benefits by experts and the total scores awarded to the benefits and rewards by the expert must exceed the total scores awarded to the costs/risks as it is usually the case with cost-benefits analysis if a decision to outsource is to be made.
- However, though the scores awarded to the benefits/rewards should exceed the scores awarded to the costs/risks, this however will not always mean that the decision is to outsource.
- The decision to outsource is rather made based on the percentage with which the scores awarded to the benefits exceed the scores awarded to the costs/risks and this is determined by allocation of weighted ratios.
- Ratios are allocated to each logistics activity according to their importance (weighting) and divided into three categories in a traffic light manner for decision making.

- The ratio allocated to each logistics activity according to their importance (weighting) are informed from the results of the primary data analysis (descriptive statistics, statistical t-test, and thematic analysis)
- The decision to outsource is made based on a traffic light system where red suggests that outsourcing will not be profitable or effective, amber suggests that outsourcing may or may not be profitable hence the organisation should decide based on their overall goals and objectives and green suggests that outsourcing will most likely be profitable and effective. **Process ends.**

Figure 4.4 below summarises the process in a sequential flow:

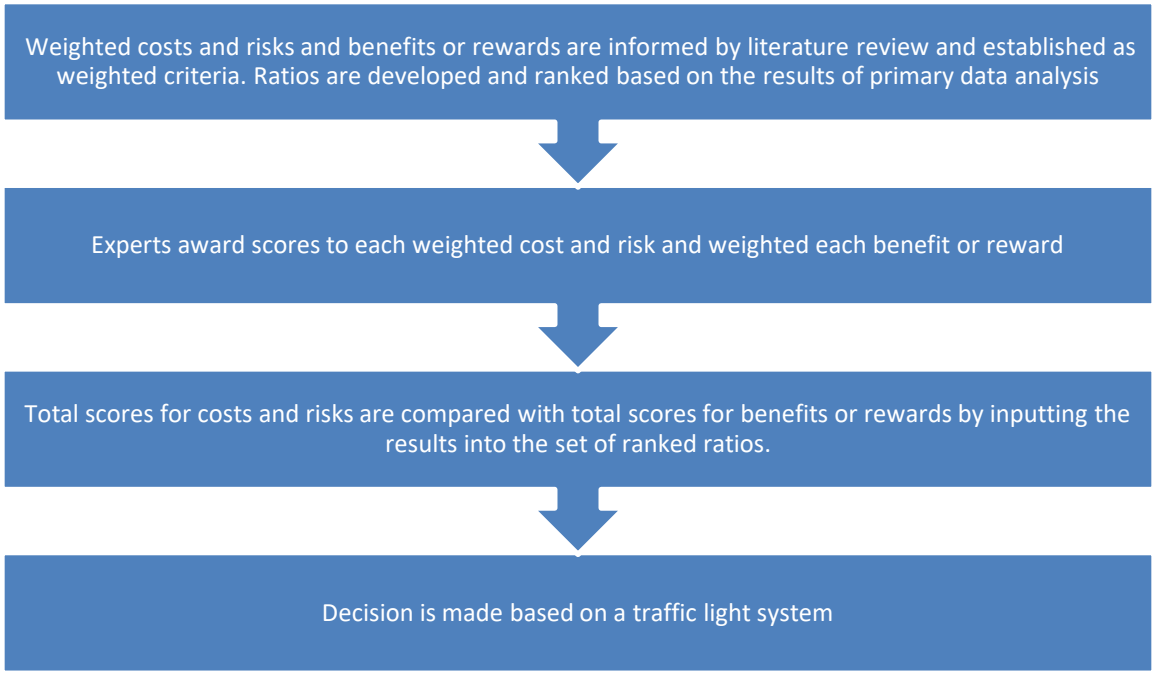


Figure 4.4: Summarizes the process of the framework.

As seen from above, some of the ingredient of the framework is different from that used by Jovcic et al. (2019) such as the traffic light system and weighted ratio and the absence of FAHP and TOPSIS. This is because the purpose of this framework is different. The process is however similar. The similarities in process between both frameworks are laid out in table 13 below. Also,

the weighted ratio and traffic light system applied in this framework have however been used in the third-party logistics literature (Akaaboune et al., 2018;). Table 3.13 below outlines the similarities between Jovcic et al. (2019) and this framework:

Table 4.12: similarities between Jovcic et al. (2019) and this research's third-party logistics decision support framework

Criteria for comparing similarities	Jovcic et al. (2019)	This framework
Purpose	Evaluation for selection of a suitable 3PL firm	Evaluation of logistics outsourcing project
Inputs – stage one	Expert experiential opinion and extensive literature review establishing criteria. Evidence based approach	Expert experiential opinion, literature review and content analysis establishing the costs/risks and benefits. Evidence based approach
Inputs – stage two	Sub-criteria are created from the criteria using expert opinion	Scores are allocated to the costs/risk and benefits using expert opinion
Inputs – stage three	Sub-criteria are weighted and ranked using FAHP	Ratios are weighted based on primary data analysis findings
Inputs – stage four	Data are collected from 3PLs based on above criteria and sub-criteria and 3PLs' suitability are ranked based on data collected and using TOPSIS	Suitability of logistics outsourcing project is ranked based on above weighted ratios using traffic light system

Output	Decision on suitable 3PL or 3PLs to select for outsourcing	Decision made on whether to source or not and what logistics activity will be profitable to outsource

The table shows that though the purpose of each framework is different overall, they both entail evaluation for decision making. The inputs are similar though they are differences as well. The first stage shows that the initial inputs are both made using expert experiential opinion and literature which is an evidence-based approach. Stage two indicates that both inputs are made using expert experiential opinion. Stage three indicates that both inputs are weighted though using different methods. Stage four shows that both inputs are ranked though using different methods. Output indicates that outsourcing decision is made on both cases.

Also, as part of an attempt to check and validate the decision support framework, the template was sent to the pharmaceutical company participant to fill, and the results are presented in appendix 5. However, one response is not enough to validate its usability and applicability hence further testing is recommended in the conclusions and recommendations chapter in section 5.4

4.8. Research Limitations

This research was limited by the notoriously challenging nature of conducting primary research of Nigerian companies. As noted earlier, the researcher used various strategies to collect data from sample organisations but arrived at only 3.48% response rate. Hence, the researcher experienced extreme difficulty in collecting data from Nigerian companies as is usually the case when conducting primary data research of Nigerian companies.

Also, the research was limited by lack of funding which would have enabled to researcher to travel to Nigeria for the required period of time necessary to collect large data set from major organisations representing various sectors in Nigeria. The research was funded personally hence there was not enough funds to travel to Nigeria.

4.9. Ethics considerations

As primary data was collected from participants; the researcher was required to follow data privacy procedures ensuring that all due protocols are observed. Hence, ethics considerations were made by the researcher to ensure that the participants consent to the way their data is being used. After the ethics committee approved the primary data collection for the research, the researcher contacted the selected fifty-one companies with the following documents:

1. A letter of permission for data collection
2. The university's participant's consent form
3. A letter from the university with a reference showing that the university has approved the data collection to be carried out by the researcher.
4. The research questionnaire
5. An information sheet for the data collection

The information sheet contained the purpose of the research, the type of data that the research aims to collect, the voluntary nature of participation which states that the participants can choose not to answer any questionnaire for whatever reason best known to them and that the participants can choose to withdraw their data any time before analysis of the data begins. The information sheet also contains the benefits and risks of participating in the data collection process. The benefits include the priority that will be given to participating organisation to share a part of the research results to them first and tailor made for them that may be useful as a

valuable decision-making tool for strategic decision making that can enable the organisations to gain competitive advantage in logistics and supply chain activities. The risk involves the possibility that the researcher may deviate from the privacy procedures of which there are consequences for doing so such as reporting to the researcher's university and to the office of the UK's information commissioner. The information sheet also sets out how the data will be stored and if the data will be re-used. The data will be stored in excel spreadsheets and after the research has been conducted and disseminated all data stored in excel will be destroyed. Hence, the data will not be re-used for future research or commercial purposes.

5.0. CHAPTER FIVE: ANALYSIS, RESULTS AND DISCUSSION

5.1. Introduction

This chapter contains an explanation of the analysis of data which includes how the data was analysed, the results of the analysis and the findings or discoveries made from the data analysis. The chapter also compares the findings of the data analysis and results with findings from the literature review from which conclusions are drawn. Data collected include primary data from participants in Nigeria including a third-party logistics company who gave information on the levels of logistics outsourcing of its customers. Secondary data was collected from sources such as World Bank and Armstrong and Associates. The primary data was analysed using descriptive statistics, statistical t-test, and thematic analysis. The secondary data was analysed using correlation analysis. First, a comparative content analysis of secondary data sources on the barriers, challenges, and barriers to the practice of third-party logistics in the UK and Nigeria was carried out and the results were used as inputs in the decision support framework. Second, descriptive statistics was used to analyse and provide insights into the quantitative primary data obtained using Likert scale questionnaires and structured interviews from participants. This was done using column charts, bar charts, pie charts, pivot charts and measures of central tendency such as mean and mode. After this, statistical t-test were performed on the primary data to determine if the difference in the mean of each variable is statistically significant. The variables are 10 logistics activities, and each was compared against the other. Then a correlation test was done to determine if a relationship exist between level of economic development and logistics operations efficiency and the strength of the relationship. A second correlation test was done to determine if there is a relationship between level of economic development and level of logistics outsourcing. A third correlation test was done to determine if there is a relationship between level of logistics cost efficiency and the level of logistics outsourcing. The findings from the correlation tests were used to propose a tentative theory. Then the findings from the literature

review were summarized and the key points from the qualitative semi-structured interviews were used to compare with the findings from the data analysis in the discussion section. The decision support framework which is main output of this research was developed at the end.

5.2 CONTENT ANALYSIS

5.2.1 Introduction

Evidence shows that third party logistics is well practiced in the developed countries of the world like the UK, USA, and Europe compared to a lower level of activity in developing and emerging economies such as Nigeria (Dapiran et al., 1996; Sink et al., 1996; Solakivi et al., 2011; Lieb et al., 1993; Arroyo et al., 2006; Tian et al., 2010; Etokudoh et al., 2017; Onyebueke et al., 2019 and Adebambo et al., 2015).

Further evidence shows that there is a dearth of research on the use of third-party logistics in Nigeria hence the need for further research into the practice of third-party logistics in Nigeria (Etokudoh et al., 2017; Onyebueke et al., 2019). Furthermore, evidence shows that third party logistics practice exists in Nigeria as Mac-Kingsley & Ihunwo, (2018) showed that there is a strong presence of third-party logistics in port operations, freight forwarding, delivery and customs clearance and 3PL continues to evolve as it generated a revenue of $4.6 billion and $5.2 billion in 2018 and 2019 respectively (Armstrong & Associates, 2020; Statista, 2020). 3PL revenue of $5.2 billion represents 1.15% of GDP showing a significant contribution to the Nigerian GDP (Armstrong & Associates, 2020; Statista, 2020), which is comparable to some developed country cases such as the US which has a very robust 3PL industry and a market size in 2021 of $234 billion, expected growth rate of 3.9% and represents 1.17% of GDP.

Furthermore, Nigerian 3PL revenue in 2019 is the highest among all African countries in figures but not in percentage of logistics cost. The entire African 3PL market generated a combined $28 billion in revenues in 2019 (Armstrong & Associates, 2020; Statista, 2020). However, literature acknowledges that the Nigerian 3PL market is still in its infancy stage (albeit with growth prospects) compared to the developed regions of the world, hence the need for further investigation into the practice of third-party logistics in Nigeria and the UK to understand the barriers preventing Nigeria's 3PL sector from developing into a mature market as well as making recommendations for further study (Etokudoh et al., 2017; Mordor Intelligence, 2020).

The aim of this comparative content analysis is to investigate the challenges and problems associated with the practice of third-party logistics in the UK and Nigeria as well as the barriers impeding further practice or growth of the 3PL industry in both countries, ranking, and comparing the main barriers and challenges of third-party logistics in the UK and Nigeria in order to find out and provide explanations as to why it is less practiced in Nigeria compared to the UK.

5.2.2 Review of Literature on barriers and challenges of 3PL in the UK and Nigeria

United Kingdom

A research study that was led by Georgia Institute of Technology along with Capgemini, DHL, and SAP in 2007, which aimed at finding out what users of 3rd party logistics wanted showed that 95% of transportation services, 76% of warehousing and 59% of custom's clearance and brokerage are outsourced in Western Europe (Macdonald, 2007, PR Newswire, 2017). Also, the study found out that in Western Europe with the UK in the lead, logistics costs because of

logistics outsourcing was reduced by 11.4% and fixed logistics assets were reduced by 21.9% freeing up capital for other investments. The areas that needed improvements in Western Europe were service level commitments, which were only 50% realized, a lack of on-going improvements and achievements in logistics services that were being offered was 41% and the insufficiency of information technology capabilities were 38% (Macdonald, 2007).

In 2014, Cooper (2014) argued that unlike most retail stores and outlets in the UK, Amazon does not rely on 3PLs for their logistics operations partly because their brand identity is a very important part of their marketing strategy, which helps them to maintain their customer loyalty. Cooper (2014) further explained: “The problem is that the retailer is effectively handing over its brand to a third party. The customer only sees that part of the chain. Some retailers are a bit uncomfortable doing that and some people have talked about taking it in house” (Cooper, 2014, p.1). Cooper (2014) further points out that for most retail companies in the UK the alternative to outsourcing is mostly too complex and expensive especially for fast fashion retail stores. Perhaps a better solution to the complexity of keeping logistics in-house, which is becoming more popular among fast fashion retail stores in the area of delivery, is click and collect. Cooper (2014) argues that click and collect is easier to manage for many fast fashion retail stores especially when the collection is in store because it can be built into existing supply chain infrastructure. However, it was also noted that some retailers such as Asda and Amazon have installed some collection points in car parks and in some London underground tube stations making click and collect a barrier to logistics outsourcing in the UK fashion retail sector.

SCALA (2019) noted that 20% of UK companies have reported an unsuccessful start to a logistics outsourcing contract according to a study that was carried out by logistics and supply chain consultancy firm SCALA. The research looked at logistics contract start-ups and found out that 15% of 3PL customers have experienced services that were lower than the expected

outcome in the areas of cost, deliverables, and lead-times. Another 5% had relationship problems with their 3PL company (Motor Transport, 2014). A further survey was done by SCALA of UK businesses and 3PLs whose revenues run into billions of pounds and clients run into the thousands to assess the level of satisfaction and areas of concerns regarding the performance of 3PLs. The survey showed that 54% of 3PLs rated their contract start-ups as highly successful in terms of timeliness or just-in-time logistics, seamless service (no or little supply chain disruption) and in terms of operating within budget or offering good quality, low-cost service. On the contrary, only 34% of 3PL customers agreed to the foregoing claims by 3PLs (Motor Transport, 2014). The foregoing shows that the level of 3PL customer satisfaction is relatively low, reflecting a low level of effectiveness of third-party logistics companies in the logistics and supply chain management of a sizeable number of 3PL customers in the UK. This also reflects the fact that the UK third party logistics industry is faced with some common challenges and issues as reflected in the reports below.

According to the Global third-party logistics industry report 2020 by ReportLinker the UK was not among the major countries with significant growth projections in 2020. The total global third-party logistics growth was estimated at $495.6 billion at the end of 2020 which was driven mainly by the DTM (Distribution and Transport Management) segment as DTM global market value is expected to reach $577 billion by 2025 (ReportLinker, 2020). The report shows that the growth contribution of DTM (distribution and transportation management) to the growth of the global third-party logistics market comes mainly from four major markets. The USA, China, Germany, and Japan are the four major markets with the most significant growth projections. The US DTM is expected to grow by 6.3%, while China's DTM is expected to grow by 9.2% adding $167.9 billion in growth to the global DTM in the next couple of years. Also, Germany's DTM (distribution and transportation management) is expected to add $14.2 billion to global DTM growth in the next few years up to 2025, while the rest of Europe is expected to add $21.4

billion to global DTM growth. Furthermore, Japan's DTM market is expected to reach $17.7 billion by 2025 (ReportLinker, 2020). The report listed the global top 18 third party logistics companies who are the major global competitors and will continue to be the major players during the projected period. Among these 3PLs none are UK owned. Six of these 3PLs are from the USA namely: C.H. Robinson, Fed Ex Corporation, Expeditors International of Washington, Inc., J.B. Hunt Transport services, Inc., XPO Logistics, Inc., and UPS Supply Chain Solutions Inc., while Japan has three 3PLs represented. Germany has three represented as well. Other countries represented are France (2), Netherlands (1), Switzerland (1) and Hong Kong (1) (ReportLinker, 2020).

The FTA (2019) noted that despite the uncertainty and disruptions caused by BREXIT, UK logistics companies are still very optimistic for the future. The total number of logistics companies in the UK in 2019 was 192,525 and almost 190,000 of these were SMEs. The industry saw growth in 2018, and the industry added 200,000 more jobs in the logistics sector. There was a strong occupational growth related to warehousing and storage because of an increase in online sales; however, the uncertainties of BREXIT led to labour shortages in several logistics areas especially in areas that are heavily reliant on EU workers. The report further described the logistics industry as the backbone of the UK economy by not only helping to move goods to and from different hubs and ports but also because it supports the construction, manufacturing, and services sectors. The report confirmed that fuel prices are higher than they were in the previous year making it a major challenge to the industry. The report also confirms that congestion on road networks is also a challenge that affects the productivity of the logistics industry. The report further noted that warehousing continues to perform strongly with 14.7% return on investment in 2017 and 11.7% in 2018 and annual growth in rental value grew to 3.1% at the end of 2018.

An example of a typical contract or third-party logistics company in the UK is Wincanton Logistics Company. Wincanton Logistics is specialized in the design, implementation, and operation of supply chain management solutions with operations in the UK, Ireland, and mainland Europe. The company's supply chain services include the following: warehousing, transport and distribution, container road transport, specialist equipment, international supply chain, intermodal, freight management, high technology equipment installation, records management, home delivery, water, and shared user services. The company also provides 4PL, consulting, inventory management, product manipulation, procurement, fleet management, reverse logistics, recycling, and retail solutions (Global Data Plc, 2022,). It also offers services such as warehouse design and build, process improvement, modelling, and simulation. The company's customers are in the automotive, chemicals, defence such as General Dynamics; retail, Agric-food products such as Halo foods; energy and petroleum such as Total; high technology, industrial, records and data management, food service, construction, and food service sectors such as Britvic (Liberto, 2015; Yusof et al., 2018; Global Data Plc, 2022). Key Customers of Wincanton logistics include a diverse range of industries, including automotive, chemicals, defence (e.g., General Dynamics), retail (e.g., Halo Foods), energy and petroleum (e.g., Total), high technology, industrial, records and data management, food service, construction, and food service sectors (e.g., Britvic).

GIST Limited is also another example of a contract or third-party logistics companies in the UK, the company is a Private Limited company with 4770 employees whose services is basically the supply of chain services for retailers and manufacturers, which includes freight road transport, general freight trucking, trucking and courier services excluding air, local trucking without storage and local trucking with storage (Hoover's Company Records, 2024). The contract logistics firm secured a huge 12-year contract valued at £3.6 billion from one of its major clients-M&S (Marks & Spencer). The contract entails warehousing and distribution services. Gist collects M&S food products from M&S suppliers and delivers them to its (M&S) regional

distribution centres and from its regional distribution centres GIST delivers to M&S stores across the UK, Netherlands, and France (World Market Intelligence News, 2015). Hence, GIST is carrying out part of M&S inbound and outbound logistics, warehousing, and distribution services. However, in 2022, M&S bought over Gist for £230 million to take full control of its food supply chain while also modernising its food supply chain network. The acquisition would eliminate contractual fees and costs. It will also enable M&S to make investments in its supply chain network as it builds on its supply chain optimisation programme Vangarde (Hoover's Company Records, 2024; Wallace and Tayler, 2022).

According to GMID - General Market Information Database (2020) and World Bank database (2020), the UK logistics performance index based on socio-economic indicators has consistently declined from 2014 to 2019 as they ranked 4th out of 160 countries, in 2014, 6th out of 160 countries in 2015, 8th out of 160 countries in 2016, 8th out of 160 countries in 2017, 9th out of 160 countries in 2018 and 11th out of 160 countries in 2019. This is also reflected in the financial reports of big UK logistics firms such as Wincanton logistics whose annual revenues have been fluctuating within the last 10 years and percentage profit margin has remained very low ranging from 2.28% to 5.74% within the last 10 years and in some years like 2011 and 2012 profits margin were negative at -1.19% and -3.94% respectively. The company turnover has remained at over 1.3 billion Euros since 2017. Nevertheless, Wincanton logistics is ranked number 3 out of 18 listed industrial transportation companies in the United Kingdom (Financial times, 2020). However, according to a Mintel (2018) UK logistical services report; the UK logistical services market is forecasted to grow steadily through to 2023, which will be driven by road freight. The following findings were made from the report below:

- The report confirms that rising fuel prices continues to be a challenge.
- Skills and driver shortages continue to pose a threat to the industry's ability to meet the continuous rise in demand for logistical services.

- Industry-wide staff recruitment and retention will continue to pose a challenge to growth.
- Demand for logistics space reached its high point in 2018, which continues to be driven by an increase in online sales and 3PLs are seeking to further digitalize their operations because of the boom in their customer's online sales.

Nigeria

According to reports on logistics risk in Nigeria by BMI Research a Fitch Group company (2014, 2015, 2016, 2017, 2018 & 2019), issues such as high congestion, high rates of traffic accidents and security issues such as armed robberies contribute to the risks of disruption in supply chains and impacts all logistics activities. Nigeria's logistics risks index score in the first quarter of 2018 was 30 out of 100 in a scale of 0-100 where 0 is the highest risk and 100 is the lowest risk. Also, World Bank database shows that Nigeria's logistics performance index (LPI) ranking was 110 out of 160 countries in 2018.

The BMI (2018) report noted that a high incidence of smuggling and other security risks further increases logistics costs, and the security control response further raises the risks of supply chain delay and rent-seeking activities. The report further noted: "Convoluted and costly trade compliance requirements, inadequate transport infrastructure and pervasive corruption at key entry points and along inland routes significantly dent Nigeria's logistical appeal" (BMI, 2018, p.6). Furthermore, the transport network in Nigeria is excessively reliant on road transport and hence the country's supply chain is forced to overly rely on the country's congested road networks and ports, which increases operational risks because of the likelihood of disruption. The BMI (2018) report further noted that despite the country's enormous oil wealth, it still has instances of energy and fuel shortages, which are also among factors that may lead to supply

chain disruption. In the first quarter of 2019 the BMI's logistics risk report noted that Nigeria's overall score was 31.5 out of 100 in terms of logistics risk compared to 30 out of 100 in the first quarter of 2018 (BMI, 2019). This placed Nigeria's global logistics risk position at 165 out of 201 nations that were measured. The foregoing analysis and statistics show the high risks of operating logistics and supply chain services as a contract or third-party logistics firm.

In addition to the foregoing risks reported by BMI (2019), some similar country specific challenges and barriers to third party logistics in the Nigerian Oil and Gas industry and manufacturing sector were identified in Etokudoh et al. (2017). They include poor infrastructure (road and port congestions), high cost of business operations, underdeveloped 3PL market, security challenges and an uncertain business environment (Adebambo et al., 2015, Etokudoh et al., 2017). The underdeveloped 3PL market owes to the fact that the market is still largely within the informal sector. The uncertain business environment owes to the volatile nature of the Nigerian market due to the regular sharp decline associated with the country's foreign exchange making the Nigerian market quite volatile.

Onyebueke et al. (2019) noted that logistics outsourcing was formally recognized in Nigeria in 1989 and were majorly used by large-scale companies such as Coca Cola, Nigerian Breweries, ExxonMobil, Oando and Total Oil. Onyebueke et al. (2019) further notes that prior to that time these companies were handling their logistics in-house, which was putting them under severe pressure and at some point, they even incurred huge business losses. Therefore, these companies started outsourcing some of their logistics functions where they have little or no competency in comparison with specialist third parties so that they can focus on their core operations, increase levels of flexibility and creativity in order to achieve efficiency in service delivery to clients and customers (Onyebueke et al., 2019; Etokudoh et al., 2017). Onyebueke et al. (2019) also noted that 85.6% of respondents in their study of logistics outsourcing in

selected Oil and Gas companies (ExxonMobil, Total E&P and SPDC) in Rivers state of Nigeria strongly agrees that outsourcing their logistics to third parties improved their service delivery.

Onyebueke et al. (2019) state that 80% of respondents in their study agreed that outsourcing their logistics have reduced overall operational costs (Etokudoh et al., 2017) because working with third party logistics drillers and engineers have helped to reduce overhead and labour costs, which coupled with the expertise that these third-party logistics engineers and drillers bring have enabled them to meet their set targets, bringing good levels of profits to their companies.

In the Etokudoh et al. (2017) study, 76% of respondents both from the Oil and Gas companies and from the 3PL companies agreed that there are benefits in logistics outsourcing. However, Onyebueke et al. (2019) notes that there are some challenges and problems of logistics outsourcing in the Nigerian Oil and Gas industry that were identified in their research. They noted that 67% of respondents agreed that lack of understanding resulting from a change in management of the 3PL customer may lead to poor service delivery, low productivity, and failure of contracts. They further noted that respondents lamented on the poor handling of documents by 3PLs and mixing up of documents with documents of competitors (other 3PL customers) may lead to the risk of sharing of information/secrets with competitors. They further reported that respondents acknowledged that corrupt managers of 3PL customers may collaborate with the 3PL companies (based on percentage cuts) to include hidden charges in the account statement. This issue of dishonesty and corruption creates issues of trust. Also, 68% of 3PL customer respondents acknowledged that many 3PLs under pay their staff and many do not provide incentives and comfortable working conditions, which discourages their staff from performing and ultimately affects the quality of service provided by 3PL companies. The foregoing issues are possible barriers to further logistics outsourcing in Nigeria.

Etokudoh et al. (2017) notes that challenges of logistics outsourcing in the Oil and Gas industry in Nigeria include: information flow management (Lieb et al., 1993), JVP (Joint venture partnership) intervention, employees' reluctance to work with 3PL staff or problems related to staff changes, vendor (3PL) capability and differences in organizational cultures (Lieb et al., 1993) were identified by their research respondents in the Nigerian Oil and Gas companies and their 3PL providers. Some of the challenges that are mentioned above such as information flow management and differences in organizational culture are aligned with Lieb et al.' (1993) findings of general challenges associated with logistics outsourcing.

Furthermore, there are already risks associated with contracting 3PLs anywhere in the world even in countries like the UK where a number of the risks mentioned in relation to Nigeria are negligible (Lambert et al., 1999; Boyson et al., 1997; Brown, 2005; Thurston, 1997; Selviaridis et al., 2008; Cooper, 2014; Afzal, 2011; Moore, 1998; Xu & Wang, 2013). Hence, contracting a third-party logistics firm in Nigeria further increases the risks that are already generally associated with outsourcing logistics to a third-party company (Etokudoh et al., 2017; Onyebueke et al., 2019). These barriers partly provide a possible explanation as to the relatively lower practice of third-party logistics in Nigeria.

Evidence also shows that unlike other sectors, which does not have a lot of empirical evidence of logistics outsourcing, many Oil and Gas corporations (especially international Oil and Gas companies with operating branches in Nigeria) contract third party logistics firms because their logistical needs are much more complex and sophisticated hence requiring the services of experts (Etokudoh et al., 2017, Onyebueke et al., 2019). Also, they contract logistics companies because keeping their logistics in-house will be very expensive due to the high assets and asset

management requirements, hence they outsource their logistics to 3PL firms to optimize resources and save costs (Etokudoh et al., 2017).

Also, there are many logistics firms in Nigeria whose customers are SMMEs (Small Medium and Micro Enterprises) across many sectors including the informal sector (Ezenwa et al., 2018). These logistics companies do not necessarily operate based on contract logistics but rather on 'pay as you go' particularly with their micro business customers and those in the informal sector and are hence not formally documented as 3PL activities (Ezenwa et al., 2018). A study by Ndu & Elechi (2014) on third party logistics among SMEs in Nigeria suggested that one of the challenges with logistics outsourcing in Nigeria is inadequate regulation of the industry, leading to a larger informal sector. Still, however, literature shows quite a significant level of logistics outsourcing amongst large corporations in various sectors in Nigeria. The challenges, problems and barriers associated with outsourcing logistics in these sectors are explored and detailed below.

Oyedijo et al. (2022) research on the restraining forces to supply chain (SC) collaboration in Nigeria with focus on the food beverage industry. The study noted that the levels of restraining forces to supply chain (SC) collaboration are namely firm level, supply chain level and external environment level. The internal firm level issues are related to human behaviour, people, and internal ethical issues. These factors can hinder effective SC collaboration within the firm. The supply chain level restraining forces are associated with weak IT infrastructure, poor governance and support systems. These factors can affect the overall structure and functioning of the SC. The external environment level restraining forces at this level are related to safety and security concerns, poor transportation infrastructure, and energy and power supply crisis. These factors are external to the firm and SC but can significantly impact SC collaboration. The internal firm level challenges are often related to issues internal to the manufacturing firms and their third-party providers. The study further noted that Behavioural issues and lack of

accountability at the individual level negatively impact the prospects of successful SC collaboration. The study further noted that despite the implementation of collaboration at the firm level, individuals play a crucial role in developing and sustaining this collaboration. Human behavioural factors can influence collaboration in a SC. Furthermore, there are complaints about certain expectations from manufacturers that may be unrealistic or unfair as perceived by the third-party provider. These expectations often do not acknowledge the conditions of the environment where these businesses operate, which include weak infrastructure, poor technological systems for inventory management, tracking, and supplier relationship management (SRM) applications.

In a study by Aigbavboa and Mbohwa (2020), potential risks associated with outsourcing were identified such as underperformance of third-party logistics (3PL), loss of expertise, corporate governance issues, undertrained vendor's employees, and loss of control of outsourced functions. The study further noted that organisational inadequacies in 3PL outsourcing arrangements in the Nigerian pharmaceutical industry includes risks associated with the inadequacies of the two organisations involved in the outsourcing process – the outsourcing company and the 3PL service provider. The potential risks associated with the outsourcing organisation are loss of expertise and internal human resources issues. On the side of the 3PL service providers, the inadequacies identified are because of the inability of the 3PL service provider to match service delivery/expectations with actual results. Mitigation strategies include having a backup service provider or using more than one provider, and risk retention, avoidance, reduction, and transfer. The under-realization of the strategic goals of the outsourcing decision refers to when service levels not achieved, when there is loss of flexibility, hidden costs, and cost reduction not realised. A critical risk of the outsourcing decision and relationship is when these goals are not realised in the form and magnitude set out in the outsourcing strategy and contract. The foregoing is often due to lack of aligning of the goals of the two organisations – the outsourcer and the 3PL service provider. Achieving short term goals

to the detriment of long-term strategic goals has been reported as a risk of goals under-realization. The study concludes that the goals of outsourcing by most organisations including those in the Nigerian pharmaceutical industry relate to the rationale to outsource. Generally, most organisations focus on cost reduction as their main goal of outsourcing. Few others consider financial goals as complementary to other non-financial strategic goals like efficiency and service targets. However, despite its benefits, outsourcing comes with risks. These risks have been grouped and categorised by researchers into operational, strategic, regulatory, technical, and corporate responsibility. The number, nature, and impact of these risks depend on the complexity of the outsourced relationships and the number of stakeholders involved (Aigbavboa and Mbohwa, 2020). In a follow-up study, Aigbavboa and Mbohwa (2020) further noted that challenges facing the pharmaceutical supply chains in Nigeria, includes stock-outs, fake and counterfeit products, supply chain disruptions, expired drugs, corruption, poor infrastructure, and weak regulatory systems. The study then categorizes the challenges into two main factors. The first factor is referred to as “People & Competency Issues”, which includes lack of skilled personnel, pilferages along the chain, and absence of competent 3rd Party Service Providers. The second factor is referred to as “Infrastructural & Regulatory Inadequacies” and includes power infrastructure, road infrastructure, and inadequate policy & regulation. Using questionnaire to collect data from 133 respondents from 64 organizations in both the private and public sectors of the Nigerian pharmaceutical industry and analysing data using descriptive, inferential, and exploratory factor analysis statistics. The study further ranked the foregoing challenges in the order where road infrastructure is the number one challenge, followed by power infrastructure, absence of competent 3PL Service Providers, and inadequate policy & regulation.

Ezenwa et al. (2020) notes that the Nigerian transport/logistics sector suffers from poor infrastructure, leading to low regional logistics performance. This poor infrastructure fails to effectively spur information and communications technology (ICT) facilitated activities in the

region. The study establishes a causal link between institutional voids (irregular intervention/policies and political corruption) and structural challenges (infrastructural deficits and weak bureaucratic processes). These factors combine to threaten the operations of local 3PL SMEs, leading to limited scope of business and lack of motivation. Hence, several structural challenges burden the local 3PL SMEs as a direct consequence of huge institutional voids in the region. These include frequent vehicle breakdowns, associated with the dilapidated road infrastructure, inadequate data management systems, unreliable telecommunication services, and unstable electricity in the country.

Ikediashi et al. (2012) noted five categories of risks associated with facility management outsourcing in Nigeria. The first is client risks and refers to risks that are due to the influence of the client on the outsourcing transaction. The significant factors are inexperienced client interruption to supply of services, and unclear responsibilities and targets. These factors account for 71.4% of the total variance identified. The second is vendor risks and are risks due to the opportunistic tendencies of outsourcing vendors. The significant factors are financial failure of chosen provider, poor quality of services, and vendor's underperformance. These factors account for 71.7% of the total variance explained. The third is contractual risks and refers risks due to inadequacies in outsourcing contracts. The significant factors are absence of benchmark for quality, inadequate definition of scope and services, lack of standard forms of facilities management contracts, inadequate planning of policy implementations, and loss of strategic flexibility. These factors account for 71.2% of the total variance explained. The fourth risk is relationship risks and refers to risks due to strained relationships between clients and vendors. The significant factors are poor relationship between client and vendor, and conflict of interest. These factors account for 76% of total variance identified. The fifth risks are general risks and refers to generic risks that can be associated with any of the other categories. The significant factors are security requirement issues and fear of uncertainty. These factors account for 65.9% of total variance explained. Each of these risk factors has a significant impact on the

management of outsourcing transactions in facilities management services. The study concluding findings indicates that overall, poor quality of services was rated the most critical while security issues were rated second which was closely followed by inexperience of clients. The study was conducted among 146 members of the International Facilities Management Association, Nigerian Chapter, who are based in Lagos, Nigeria. The participants included facilities managers, property managers, maintenance officers, and procurement officers from both client organizations and vendors. The data collected was analysed using descriptive statistics and factor analysis with the help of the Statistical Package for Social Sciences (SPSS). The study identified 50 risk variables and used mean, standard deviation, and ranks to extract the critical risk factors. These critical risk factors were then grouped into five distinct categories. Principal Component Analysis (PCA) was used to identify the most representative risk factors in each category. The agreement on the rankings of the outsourcing risks by the clients and vendors was tested using the Mann-Whitney U test.

Hatami-Marbini et al. (2024) conducted a study on the risks associated with Nigerian oil and gas supply chain. Criminality and terrorist attack risk, explosion risk, logistics risk, and environmental risk are identified as the most significant risk factors in the Nigerian oil industry supply chain. Nearly 80% of the study respondents agreed with these findings. More than 80% of the respondents suggested that a lack of early warning information, insufficient physical security around the facility, poor awareness of national and regional security situations, and poor governance and training and adherence to safety were the major causes of risk. Approximately 50% of responses suggested that the lack of use of advanced security technology, poor collaboration and communication between stakeholders, and diversified modes of transportation are exacerbating these risk factors. The experts identified the absence of qualified risk management personnel, the need for a supportive top-down organisational risk management culture, a lack of understanding of the perceived benefit of effective risk management, access to new technology, a short-time horizon to meet the demand requirement, and inadequate

communication amongst stakeholders as significant challenges in implementing mitigation strategies. While the lack of perceived benefit of effective risk management and time horizon had low support as significant challenges.

In conclusion, the literature does not provide conclusive evidence or reasons for the differences in levels of logistics outsourcing between developed economies such as the UK and developing economies such as Nigeria. Hence, a thorough and comprehensive analysis of the barriers, challenges and problems that exist in these regions partly fills the foregoing gap. It is also useful in informing a better practice in Nigeria.

5.2.3 Research work: data collection and Analysis

The research adopted a content analysis method which reviewed data and information about third party logistics in the UK and Nigeria from various sources. This section explains the process through which this research was carried using thematic content analysis. The SALSA method was adopted for this research. This includes search (defining searching strings and types of databases used), assessment (using pre-defined literature inclusion and exclusion, and relevance to the research question and objectives), synthesis (extract and categorize the data using thematic analysis), and analysis (discuss the result and finally reach into conclusion) (Mengist, Soromessa, and Legese 2020). The search and assessment process are laid out in table 5.1 below:

Table 5.1: search and assessment process

Search words	Database	Boolean operator	Inclusion and exclusion criteria

"Nigeria", "third-party logistics industry", "UK", "third-party logistics industry, Nigerian 3PL", UK "3PL", "market report", "logistics outsourcing", "Nigeria logistics outsourcing"	1. ABI/INFORM complete database	"AND" "OR"	• Geographical location of research-include only UK and Nigeria • Date of publication-exclude any publication older than 30 years • Publication in English • Exclude online newspapers and magazines • Include trade journal magazines and newspapers

ABI/INFORM complete database was the main database used to search for academic papers and conference proceedings. Search words such as "UK AND third-party logistics industry" "Nigeria AND third-party logistics industry" "Nigerian 3PL AND market report" "UK 3PL AND market report" "logistics outsourcing AND Nigeria" "logistics outsourcing AND UK" were used. The search on ABI/INFORM complete database generated over 130,918 papers and after inclusion and exclusion criteria were used, 40 papers were selected. The 40 papers included 24

academic journal papers, conference papers, industry reports and 16 were trade journal newspapers and magazines.

Also, special databased, research and evidence based websites were consulted such as General Market Information Data (GMID), World Bank database, Statista, Armstrong & Associates, Mordor Intelligence, Mintel, Ibis World and Report Linker. These websites were used to obtain insights, quantitative data, and statistics about the third-party logistics market in the UK and Nigeria. Also, special industry reports were included in the analysis such as UK logistics report by Freight Transport Association (FTA), UK logistical services report by Mintel, UK third party logistics report by SCALA consulting, Nigeria third party logistics market report and forecast by Mordor Intelligence and Nigeria logistics risks quarterly reports by BMI Research the Fitch Group company. The research is focused on the Nigerian third-party logistics industry, but the content analysis included an investigation on the barriers, challenges and problems associated with third-party logistics in the UK to compare with the Nigerian 3PL logistics outsourcing practice. This was done to identify areas of the UK 3PL logistic outsourcing practice that may be useful to improve the practice in Nigeria.

However, a second search was done which focused on the practice of 3PL logistics outsourcing in Nigeria only. The search and assessment process are laid out in table 5.2 below:

Table 5.2: search and assessment process

Search terms	Boolean operators	Data bases	Inclusion and exclusion criteria	Results
“Third-party”, “logistics”, “Nigeria”,	“AND”	Taylor and Francis	Within 15 years age limit	260
			Abstract and keywords	0

“Third-party”, “logistics”, “Nigeria”,	“AND”	Scopus	Abstract and keywords and within 15 years age limit	10
			Duplicates	9
			Screen each paper for relevance (papers relevant to the problems, barriers and challenges of 3PL in Nigeria)	2 papers selected
“3PL” “logistics” “Nigeria”	“AND”	Scopus	Abstract and keywords and within 15 years age limit	3
			Duplicates	2
			Screen paper for relevance	0
“3PL logistics outsourcing Nigeria”	“AND” “OR”	Scopus	Abstract and keywords and within 15 years age limit	1
			Duplicates	0
“Third-party logistics” “outsourcing” “Nigeria”	“AND”	EBSCO	Search in titles	0
			Abstract and author’s keyword only	0
“Third-party” “logistics” “outsourcing” “Nigeria”	“AND” “NOT”	Emerald	Open-source content and content with access, between 2009-2024 and all types of Emerald content	100
			Exclude papers with no access	99
			Exclude all appendices	90

			Exclude research focused outside of Nigeria	78
			Exclude duplicates	77
			Screen each paper relevance	1 paper selected
"Third-party" logistics" "outsourcing" "Nigeria"	"AND" "NOT"	Science Direct	Abstract and keywords	103
			Limit paper types to review articles, research articles and book chapters	85
			Limit to papers within 15 years age limit	73
			Screen through for relevance to research focused on Nigeria and focused on the problems, barriers and challenges of 3PL in Nigeria	2 papers selected
"3PL outsourcing Nigeria"	"AND"	Science Direct	Abstract and keywords	7
			Exclude duplicate	6
			Screen for relevance	1 paper selected

From the table above only 6 additional papers were selected from the second search which focused on the problems, challenges and barriers associated with third-party logistics in Nigeria. The paper titles, authors and date of publication are listed out in appendix 4.

The research reviewed all secondary data obtained from the various sources as mentioned above first, in the case of the UK and then Nigeria. After each review, the barriers and challenges facing the practice of 3PL in each country are listed in table 1 below. The context in

which the issues were identified was also summarised in the table. Sub-themes that are based on the context in which the issues were identified in the data are also listed table 1 below. Then themes were created from these sub-themes (Bell et al., 2022) in tables 2 and 3 representing patterns and similarities that were identified in the data and that are commonly categorized under a common topic of interest (Bell et al., 2022). The themes were then ranked in order of priority or importance according to frequency of occurrence in a third table. The ranking was done first by listing the issues and their sub-themes in the UK case that was found in the literature and ranking the issues in the order of 1 as highest and 6 as lowest based on their frequency of appearance in the literature. Then In the Nigerian case, the issues and their sub-themes that were identified in the literature were also listed in a table and ranked in the order of 1 as highest and 22 as lowest based on the frequency of appearance in the literature. The themes in both cases were then identified in a second and third table based on associated sub-themes. First in the case of the UK and then the Nigerian case. Then a fourth and fifth table ranked the themes in both cases, first in the UK case and then the Nigerian case according to order of importance based on the frequency of occurrence of the themes as identified by the sub-themes. The sub-themes are phrases or words that describe in summary important concepts found in the data that are relevant to answering the research questions and meeting the research objectives (Bell et al., 2022).

5.2.4 Results: creating themes and ranking them

A few challenges have been identified in UK third party logistics from the various reports above. The challenges are retailer's brand image (Cooper, 2014), contract start-up relationship problems and outsourcing relationship issues (SCALA, 2019), labour and driver shortages (Mintel, 2018; FTA, 2019), rising fuel prices (Mintel, 2018; FTA, 2019), road congestion (FTA, 2019) and click and collect (Cooper, 2014). In the Nigerian case, the barriers and challenges are

more; up to 22 were identified and listed below. Table 5.3 below shows the list of the challenges, problems, limitations, and barriers to third party logistics practice in the UK and Nigeria, the context of use and themes.

Table 5.3: issues identified in the UK and Nigerian case study. List of challenges, problems and barriers affecting the UK and Nigerian third-party logistics industry respectively

NO.	UK issues	$f(x)$	Context	Sub-themes
1.	Driver & labour shortages	2	Causes mild supply chain disruption as reported by FTA (2019)	Economic risk
2.	Rising fuel prices	2	Causes higher costs, reported by FTA (2019)	Economic risk
3	Road congestion	1	Reported by FTA causes mild disruption (2019)	Infrastructure risk
4	Click and collect	1	Presented as a barrier to further logistics outsourcing in the UK retail sector up till 2014 (Cooper, 2014).	collection
5	Brand image	1	Presented as a barrier to further logistics outsourcing in the UK retail sector (Cooper, 2014)	Branding
6	Contract start-up relationship problems and	1	Reported by SCALA (2019) as one of the challenges and	Relationship issues

	outsourcing relationship issues		problems facing the UK 3PL market	
NO	**Nigeria issues-**	$f(x)$	**Context**	**Sub-themes**
1	Congested and poor road networks and ports/poor infrastructure	12	Identified by BMI Nigerian logistics risk reports 2014 to 2019, Ezenwa et al. (2020), Oyedijo et al. (2022), Aigbavboa and Mbohwa (2020) and Etokudoh et al. (2017) as a barrier preventing foreign contract logistics companies from entering the Nigerian market. Disrupts entire supply chain. Challenges and problems with 3PL practice in Nigeria	Infrastructure risk
2	Security issues such as smuggling and robbery, terrorist attacks, pilferages	10	Identified by BMI Nigerian logistics risk reports 2014 to 2019, Oyedijo et al. (2022), Hatami-Marbini et al. (2024), Aigbavboa and Mbohwa (2020) and Etokudoh et al. (2017) as a barrier preventing and discouraging foreign	Security risk

			contract logistics companies from entering the Nigerian market. Disrupts the entire supply chain.	
3	High rate of traffic accidents and safety concerns	7	Reported to be one of the barriers preventing foreign contract logistics companies from entering the Nigerian market by BMI Nigerian logistics risk report 2014 to 2019, Oyedijo et al. (2022). Disrupts the entire supply chain	Accidental risk
4.	Corruption and dishonesty	5	Reported by Onyebueke et al. (2019), Aigbavboa and Mbohwa (2020) and Ezenwa et al. (2020) as a major challenge of outsourcing logistics in Nigeria preventing further logistics outsourcing. Collaborations between managers of 3PLs and managers of 3PL clients to include hidden charges in the	Behaviour risk

			contracts. Managers of 3PL clients get a percentage cut.	
5	Poor information flow management/risk, inadequate data management systems and exposure of 3PL's customer secrets to competitors	4	Reported by Etokudoh et al. (2017), Onyebueke et al. (2019), Hatami-Marbini et al. (2024) and Ezenwa et al. (2020) as a major challenge that 3PL customers experience in Nigeria. Organizations are conservative towards logistics outsourcing for reasons such as this	Confidentiality risk
6	Poor governance	4	Poor governance by the outsourcing firm. Reported by Oyedijo et al. (2022), Ikediashi et al. (2012), Aigbavboa and Mbohwa, (2020), and Hatami-Marbini et al. (2024).	
7	Poor vendor or 3PL capability	4	Reported by Etokudoh et al. (2017), Aigbavboa and Mbohwa (2020), and Ikediashi et al. (2012) that leads to poor service delivery	Vendor capability

			as one of the challenges of logistics outsourcing in Nigeria	
8	Inadequate regulations of the Nigerian third-party logistics industry	4	Reported by Ndu & Elechi (2014), Ezenwa et al. (2020), and Aigbavboa and Mbohwa, (2020) as one of the challenges and barriers to logistics outsourcing in Nigeria. This is because potential 3PL customers do not feel that outsourcing contracts are well protected in the current regulation.	Contract risk
9	Power infrastructure	3	Reported by Oyedijo et al. (2022), Aigbavboa and Mbohwa (2020) and Ezenwa et al. (2020)	Infrastructure risk
10	Employees' reluctance to work with 3PL staff or problems related to staff changes and undertrained/unskilled 3PL staff	3	Reported by Etokudoh et al. (2017) and Aigbavboa and Mbohwa (2020), as one of the challenges of logistics outsourcing in Nigeria.	staffing risk

11	Differences in organizational cultures/poor collaboration	2	Reported by Etokudoh et al. (2017) differences in organizational culture between the vendor (3PL) and its clients. Recognized as challenges 3PL customers generally experience in most countries including Nigeria. Poor collaboration reported by Hatami-Marbini et al. (2024)	Organizational culture
12	High cost of business operations	1	Reported by Etokudoh et al. (2017) as one of the country specific challenges that Oil and Gas companies experience while outsourcing logistics to 3PLs in Nigeria. Hence, not much savings is achieved from logistics outsourcing	Operations cost
13	Uncertain business environment	1	Reported by Etokudoh et al. (2017) as one of the country specific challenges that Oil and Gas companies experience while outsourcing	Economic risk

			logistics to 3PLs in Nigeria. This is caused by regular changes in government policies and actions that impact key areas such as the currency exchange rate	
14	Underdeveloped third party logistics business market	1	Reported by Etokudoh et al. (2017) as one of the country specific challenges that Oil and Gas companies experience while outsourcing logistics to 3PLs in Nigeria. Too many socio-economic challenges keeping the 3PL market largely informal	Economic Risk
15	Joint venture partnership intervention	1	Reported by Etokudoh et al. (2017) as one of the challenges of logistics outsourcing in Nigeria. Joint venture or new partnership and stakeholder may decide to keep activities in-house	Partnership intervention
16	Change in management	1	Reported by Onyebueke et al. (2019) as one of the	Change management

			challenges of logistics outsourcing in Nigeria. New management of a 3PL client may decide to terminate the outsourcing contract.	
17	Underpayment of staffs by 3PLs and unfavourable working conditions	1	Reported by Onyebueke et al. (2019) as one of the challenges that lead to poor service by 3PLs and reported as one of the factors that discourage companies from outsourcing their logistics to 3PLs in Nigeria	Unfavourable working conditions
18	Lack of advanced technology	1	Reported by Hatami-Marbini et al. (2024)	Innovation challenge
19	Loss of control	1	Reported by Aigbavboa and Mbohwa, (2020)	Change management
20	Loss of flexibility	1	Reported by Aigbavboa and Mbohwa, (2020)	Change management
21	Supply chain disruptions	1	Reported by Aigbavboa and Mbohwa, (2020)	Supply chain risk
22	Strained relationships	1	Reported by Ikediashi et al. (2012)	Relationship risk

Table 5.4: themes- UK case study Lists the sub-themes and associated broad themes in the UK case study.

No.	Sub-themes- UK case study	Themes- UK case study
1	Economic risk	Risk management (challenges facing the logistics industry)
2	Economic risk	Risk management (challenges facing the logistics industry)
3	Infrastructure risk	Risk management (challenges facing the logistics industry)
4	Branding	Business strategy (barriers limiting outsourcing)
5	Collection	Business strategy (barriers limiting outsourcing)
6	Relationship issues	Relationship management (problems encountered while outsourcing)

Table 5.5: Themes- Nigerian case study lists the sub-themes and associated broad themes in the Nigerian case study

	Sub-themes- Nigerian case study	Themes- Nigerian case study
1.	Infrastructure risk	Risk management (challenges facing the logistics industry)
2.	Security risk	Risk management (challenges facing the logistics industry)
3.	Accidental risk	Risk management (challenges facing the logistics industry)
4.	Behaviour risk	Risk management (barriers limiting the further use of 3PLs)
5.	Confidential risk	Risk management (barriers limiting the further use of 3PLs
6.	Economic risk	Risk management (challenges affecting business operations in Nigeria deterring foreign 3PLs from entering the market)
7.	Economic risk	Risk management (challenges affecting business operations deterring foreign 3PLs from entering the market)

8.	Staffing risk	Risk management (problems associated with logistics outsourcing in Nigeria)
9.	Contract risk	Risk management (challenges deterring some organisations from outsourcing)
10.	Operations cost	Cost efficiency (high cost of business affecting cost of outsourcing and reducing overall cost efficiency)
11.	Vendor capability	Service delivery (poor vendor capability deterring some organisations from outsourcing)
12.	Partnership intervention	Relationship management (problems associated with outsourcing in Nigeria)
13.	Organisational culture	Relationship management (problems generally associated with outsourcing)
14.	Unfavourable working conditions	Service delivery (problems limiting the further use of 3PLs in Nigeria)
15.	Change management	Relationship management (problems generally associated with outsourcing)
16.	Supply chain risk	Risk management (risks associated with logistics outsourcing)
17.	Relationship risk	Relationship management (strained relationships between clients and vendors. Problems associated with outsourcing)
18.	Innovation challenge	Service delivery (problem with supply chain in the Nigerian oil and gas sector)

Table 5.6: Ranking themes- UK case study

No.	Themes	Frequency

1	Risk management	3
2	Business strategy	2
3	Relationship management	1

Table 5.7: Ranking themes- Nigerian case study

No.	Themes	Frequency
1	Risk management	10
2	Relationship management	4
3	Service delivery	3
4	Cost efficiency	1

Table 5.3 lists the various issues found in the UK and Nigerian case study respectively. These issues were classified into sub-themes with phrases that helped the researcher to organise and categorise them into more common themes as seen in tables 5.4 and 5.5. Tables 5.4 and 5.5 also show how the themes meet the aims of this content analysis. Recall that the aim of the content analysis is to investigate the challenges and problems associated with 3PL practice in the UK and Nigeria as well as the barriers impeding further practice or growth in both cases. Hence, as noted in table 5.5 some of the themes only indicate challenges encountered in the Nigerian logistics industry which ultimately affects the 3PL industry. Examples are sub-themes such as infrastructure risk, security risk and accidental risk all associated with risk management theme. Other sub-theme associated with the broader risk management theme such as behavioural risk, contract risk and confidentiality risks are barriers directly limiting further growth of 3PL practice in Nigeria. While the economic risk sub-themes also associated with the broader risk management theme are challenges affecting business operations in Nigeria hence deterring

foreign 3PLs from entering or expanding operations in the Nigerian market which limits the growth of the 3PL industry. Also, sub-themes such as unfavourable working conditions and vendor capabilities both associated with service delivery theme are barriers limiting the further growth of 3PL practice in Nigeria. Sub-theme such as change management is a problem generally recognised in the literature that is often encountered during outsourcing and this was identified in the Nigerian case study. It is associated with the broader relationship management theme. Also, as seen with the UK case study, relationship management issues are generally identified as issues or problems often encountered globally in outsourcing. Furthermore, sub-themes such as partner intervention and organisational culture both associated with relationship management theme are problems associated with outsourcing in Nigeria. Operations cost sub-theme associated with the broader cost efficiency theme is a challenge affecting the overall cost savings that could have been made in logistics operations and ultimately with outsourcing.

In the UK case study also, sub-themes such as economic and infrastructure risk both associated with risk management theme are challenges facing the logistics industry which ultimately affects the 3PL industry. Branding and collection sub-themes associated with business strategy theme are barriers limiting the use of 3PL services in the UK. Also, relationship issue as a sub-theme associated with relationship management theme are challenges encountered in 3PL practice in the UK.

5.2.5 Comparison between Nigeria and the UK

The content analysis shows differences between 3PL practice in the UK and Nigeria, and these are summarised in table 6 below:

TABLE 5.8: DIFFERENCES BETWEEN THE 3PL PRACTICE IN NIGERIA AND THE UK

Country	No. of themes	Total appearance of themes	Total appearance of themes associated with barriers limiting 3PL use
Nigeria	4	18	7
UK	3	6	2

The table above shows that the 4 broad themes in the Nigerian case study appeared 18 times in the data which is 4.5 times more than the number of themes. While the 3 broad themes in the UK case study appeared only 5 times which is 1.66 times more than the number of themes.

Also, in the Nigerian case study, while 7 themes are associated with barriers limiting the further practice of 3PL, only 2 themes are identified in the UK case study as barriers limiting the further practice of 3PL. The foregoing partly provides empirical evidence and explanation to the lower use of 3PL in Nigeria compared to the UK. The foregoing owes to the fact that some sub-themes, such as behavioural risk which are softer factors namely dishonesty and corruption were among the identified barriers to the further use of logistics outsourcing in Nigeria but only barriers related to business strategy were identified in the UK case study.

In both countries there are risk management themes most of which are outside the control of organisations. In the Nigerian case study such risks are two infrastructure risk sub-theme, security risk, accidental risk, two economic risks, supply chain risk, and contract risk sub-themes. Hence, organisations will usually find a way to manage the risks usually by sharing these risks with a third-party (Onyebueke et al., 2019; Adebambo et al., 2015; Wang and Regan, 2002). While these kinds of risks which are outside the control of organisations are 8 in the Nigerian case study, they are only 3 in the UK case study.

Furthermore, the overall analysis shows that the UK third-party logistics industry has a well-matured market, while Nigeria's 3PL sector is under-developed but developing. The UK logistics

industry continues to grow and is forecasted to grow further despite a few operational and commercial challenges. The Nigerian logistics industry does not show as much potential according to BMI reports due to levels of supply chain risks however, there are still significant growth projections, due to the size of the economy, according to Mordor Intelligence (2020).

In the Nigerian Oil and Gas sector, logistics outsourcing has contributed to efficiency, improved service delivery, cost savings and increased profit making. On the other hand, in the UK, the foregoing results have been achieved as well but evidence shows that they have been achieved in various sectors of the economy and not just in the Oil and Gas sector.

In the UK, however, major 3PL customer satisfaction was reported to be quite low at only 34%. On the other hand, Etokudoh et al. (2017) reported that 76% of 3PL customers that were studied in the Nigerian Oil and Gas sector agreed that logistics outsourcing has been beneficial, though not specifically related to customer satisfaction, and Onyebueke et al. (2019) reported that 80% of 3PL customers that were studied in the Nigerian Oil and Gas sector agreed that logistics outsourcing has been beneficial in terms of cost reduction. However, most of these Oil and Gas companies are international companies with operating branches in Nigeria.

5.3 Clarification of logistics activities

Some terms used to describe logistics activities in this research require clarification. These are transportation and distribution, outbound logistics and inbound logistics. Though these three terms are all classified as transportation activities, however for the purpose of this research, these three terms are separated. Transportation and distribution refer to the movement of goods within an organisation for example moving finished products from the factory to retail outlets owned by the manufacturer and vice versa. Inbound logistics refers to the movement of raw material or parts from suppliers to the factory site or warehouse and outbound logistics refers to the movement of finished goods from the manufacturer's warehouse or from manufacturers retail outlets, or from a retailer's warehouse or outlet to the final consumer- that is last mile delivery. Data collected from participants using structured interview is summarized below:

5.4. Summary of data collected from Likert scale questionnaires

The tables below are the data collected from respondents in Nigeria using Likert scale questionnaire. The list of questions that were asked are found in appendix 2B:

5.4.1 Level of logistics outsourcing- data from Nigerian participants

Table 5.9: summary of data collected from participant organizations in Nigeria on levels of logistics outsourcing

Category	Pharmaceutical	FMCG	Agriculture1	Agriculture2	Manufacturing
Transportation and distribution	All activities- 4 (100-76%)	High- 3 (75-51%)	High- 3 (75-51%)	Low- 1 (25-1%)	Partial- 2 (50-26%)

Inbound and outbound logistics	Inbound logistics partial- 2 (50-26%) Outbound logistics high- 3 (75-51%)	All activities- 4 (100-76%)	Inbound logistics no activity- 0 Outbound logistics high- 3 (75-51%)	Inbound logistics Partial- 2 (50-26%) Outbound logistics high- 3 (75-51%)	High- 3 (75-51)
Warehousing	Partial- 2 (50-26%)	All activities- 4 (100-76%)	High- 3 (75-51%)	High- 3 (75-51%)	Low- 1 (25-1%)
IT tracking	Nil	High- 3 (75-51%)	Partial- 2 (50-26%)	Low- 1 (25-1%)	High- 3 (75-51%)
Customer service	Nil	All activities- 4 (100-76%)	Partial- 2 (50-26%)	Partial- 2 (50-26%)	Nil
Inventory management	Nil	High- 3 (75-51%)	Nil	Nil	Nil
Order processing	Nil	High- 3 (75-51%)	Nil	Nil	Nil
Packaging	Nil	High- 3 (75-51%)	Nil	High- 3 (75-51%)	Low- 1 (25-1%)
Material handling	Nil	All activities- 4 (100-76%)	Nil	Nil	Partial- 2 (50-26%)

5.4.2 Logistics outsourcing and business performance data from Nigerian participants

Table 5.10: summary of data collected from participant organizations in Nigeria on logistics outsourcing and business performance.

Category	Pharmaceutical	FMCG	Agriculture1	Agriculture2	Manufacturing
Transportation and distribution	Extremely high- 5	High- 4	High- 4	Extremely high- 5	Extremely high- 5
Inbound and outbound logistics	Extremely high- 5	Inbound logistics: High- 4 Outbound logistics: Extremely high- 5	Inbound logistics- N/A Outbound logistics- High- 4	Inbound logistics: High- 4 Outbound logistics- Neutral- 3	Inbound logistics: Extremely high- 5 Outbound logistics: High- 4
Warehousing	High- 4	Extremely high- 5	Neutral- 3	Extremely high- 5	Neutral- 3
IT tracking	Extremely high- 5	Extremely high- 5	N/A	Low- 2	Neutral- 3
Customer service	Nil	Extremely high- 5	High	Low- 2	Low-2
Inventory management	Nil	Extremely high- 5	N/A	N/A	Neutral- 3

Order processing	Nil	Extremely high- 5	N/A	N/A	Neutral- 3
Packaging	Nil	Extremely high- 5	N/A	N/A	High- 4
Material handling	Nil	Extremely high- 5	N/A	N/A	High- 4

5.4.3 Logistics outsourcing and cost efficiency data from Nigerian participants

Table 5.11: summary of data collected from participant organizations in Nigeria on logistics outsourcing and cost efficiency

Category	Pharmaceuticals	FMCG	Agriculture 1	Agriculture 2	Manufacturing
Transportation and distribution	4, very high-cost savings 41% above	4, very high-cost savings 41% above	3, high cost saving 26-40%	3, high-cost savings 26-40%	2, medium level cost savings 11-26%
Inbound and outbound logistics	4, very high-cost savings 41% above	Inbound logistics 3, high-cost savings 26-40%. Outbound logistics 4, very high-cost	Inbound logistics N/A. Outbound logistics 3, high-cost savings 26-40%	Inbound logistics 2, medium level cost savings 11-25%. Outbound logistics 3, high-cost	3, high-cost savings 26-40% for both inbound and outbound logistics

		savings 41% above		savings 26-40%	
Warehousing	2, medium cost savings 11-25%	4, very high-cost savings 41% above	3, High cost saving 26-40%	3, high-cost savings 26-40%	1, low-cost savings 1-10%
IT tracking	Nil	3, high-cost savings 26-40%	N/A	2, medium level cost saving 11-25%	4, very high-cost savings 41% above
Customer service	Nil	4, very high-cost savings 41% above	2, medium level cost saving 11-25%	3, high-cost savings 26-40%	1, low-cost savings 1-10%
Inventory management	Nil	4, very high-cost savings 41% above	N/A	N/A	1, low-cost savings 1-10%
Order processing	Nil	4, very high-cost savings 41% above	N/A	N/A	1, low-cost savings 1-10%
Packaging	Nil	4, very high-cost	N/A	N/A	4, very high-cost savings 41% above

		savings 41% above			
Materials handling	Nil	3, high cost saving 26-40%	N/A	N/A	3, high-cost savings 26-40%

5.4.4 Third-party logistics modern technology and operations efficiency and customer satisfaction

Table 5.12: summary of data collected from participant organizations on 3pl modern technology and operations efficiency and customer service.

Category	Pharmaceutical	FMCG	Agriculture1	Agriculture2	Manufacturing
Operational efficiency- Cost saving and responsiveness	Agree- 4	Strongly agree- 5	Agree- 4	Disagree- 2	Strongly agree- 5
Customer service- Customer satisfaction (customer retention and customer loyalty)	Agree- 4	Strongly agree- 5	Agree- 4	Agree- 4	Strongly agree- 5

5.4.5 Data from third-party logistics company on levels of logistics outsourcing from their customers

The 3PL company has been operating in Nigeria for 6 years and has spread to all 36 states in Nigeria. The organization has a customer base of over 500 companies in Nigeria who outsource some or all their logistics activities to the 3PL company. Two of these companies were participants during the data collection stage of this research. The 3PL company has over 60 large corporations and over 300 small to medium enterprises in their customer base. The table below shows the response of the 3PL company to the level of outsourcing of each logistics activity from its customers. Table below shows how much of each logistic activity is outsourced by its customers.

Levels of logistics outsourcing to the 3PL company

Table 5.13: 3pl customers' outsourcing demand on each logistics activity.

Logistics activities	Zero activity- 0	Low activity- 1	Medium activity- 2	High activity- 3	Full activity- 4
Warehousing					Yes
Inventory management		Yes			
Transportation/distribution					Yes
Outbound logistics (i.e., delivery to end customers- last mile delivery)					Yes
IT (e.g., tracking)					Yes
Inbound logistics					Yes
Customer service		Yes			
Material handling		Yes			

Order management		Yes			
Packaging		Yes			

5.5 DESCRIPTIVE STATISTICS

5.5.1 Analysis of numeric data from structured interview

The number of states in Nigeria is 36 apart from the federal capital territory (FCT). The respondents who indicated 36 states as coverage of their organisation's business operations, refers to all states in Nigeria including the FCT. Hence, the average coverage of states is calculated against 36 as total number of states not 37. The descriptive analysis of numerical data extracted from the interviews is presented in table 12 below.

The structured interview notes (raw data) are provided in appendix 2

Table 5.14: analysis of numeric data from structured interviews.

Questions	pharmaceutical	FMCG	Manufacturing	Agriculture1	Agriculture2	Average & percentage
Number of states in operation	24	36	2	36	36	26.8/36×100= 74.4%
Levels of logistics	Heavy logistics 3	Heavy logistics 3	Heavy logistics 3	Heavy logistics 3	Heavy logistics 3	3/3×100= 100%

Number of years of logistics outsourcing	30	10	7	10	Not ascertain	Average= 14.25
Break point in outsourcing	0=30	0=10	0=7	0=10	No breaks	57/57×100 = 100%

The analysis in the table above shows that the average number of states in Nigeria covered by the respondents is 26.8 out of 36. Which when the formula for percentage is applied indicates that participant organisations cover 74.4% of states in Nigeria.

Also, the respondents were asked what level of logistics activity their organisations were involved in. The options were low= 1, medium= 2, heavy= 3. All respondents indicated 3 which indicates 100% heavy logistics operations by the respondents.

Third, the respondents were asked the number of years their organisation have been involved in outsourcing logistics and the responses shows an average of 14.25 years with the pharmaceutical company having the highest number of years at 30 years.

Furthermore, the respondents were asked if there were any breaks in logistics outsourcing and all respondents answered no which indicates a 100% time of logistics outsourcing since inception. However, the Agriculture2 noted that during off seasons outsourcing activities are reduced.

5.5.2 Level of logistics outsourcing

Figure 1- clustered column chart below shows a comparative view of the percentage of logistics outsourcing activities across the sectors represented. The chart shows which logistics activity is more outsourced in each sector represented. It also shows which logistics activities are most outsourced and which logistics activities are least outsourced among the sectors represented. It also shows which sector represented is most engaged in logistics outsourcing. The data was collected using Structured questionnaire where predetermined values were assigned to the levels of logistics outsourcing. These values were then converted to percentage representing how much of each logistics activity is outsourced by each participating organisation. The values are 4 being the highest representing 100-76% of a particular logistics activity outsourced, 3 represents 75-51% of a particular logistics activity outsourced, 2 represents 50-26% of a particular logistics activity outsourced and 1 represents 25-1% of a particular logistics activity outsourced and 0 represents 0% of outsourcing. However, because charts were used, these range of percentage values were represented by the highest point such that 4 was interpreted as 100%, 3 was interpreted as 75%, 2 was interpreted as 50% and 1 was interpreted as 25% as seen in the chart below:

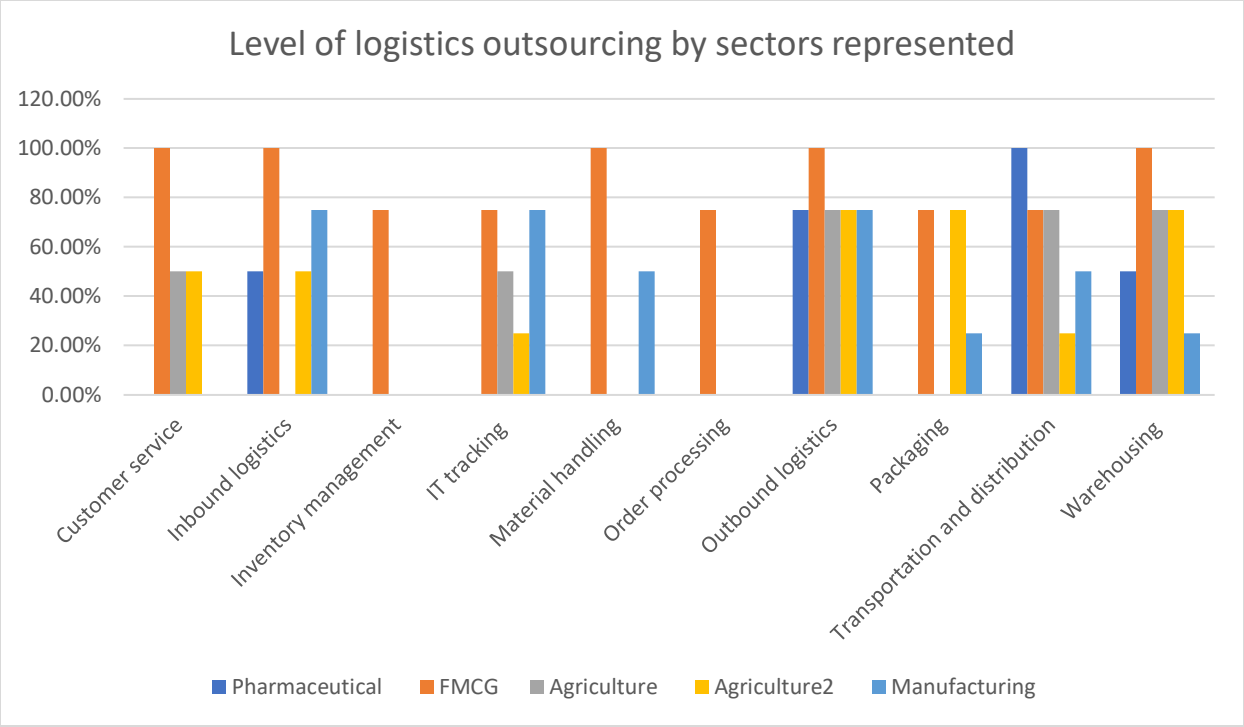


Figure 5.1: Clustered column chart showing levels of logistics outsourcing by sectors represented.

Figure 5.1, clustered column chart above shows that FMCG has the highest number of 100% level of logistics outsourcing. It also shows that warehousing, transportation and outbound each have five columns represented while other logistics activities have less than five columns. This indicates that three logistics activities are the most outsourced. Also, among the three most outsourced, outbound logistics has the highest number of 75% and 100% columns indicating that it is the most outsourced logistics activity. Similar to the foregoing, Pivot charts and tables are shown in the later part of this section of the chapter, and they show counts of percentages and values according to sectors represented and logistics activities. The clustered column chart above also shows that order management/processing and inventory management each have only one column indicating that they are the two least outsourced logistics activities. The chart also shows that agriculture (both) and manufacturing do not have any logistics activity

outsourced at 100%. Also, pharmaceutical outsource only transportation and distribution at 100%. Figures 5.2 to 5.6 below are column and bar charts which shows the logistics activities that are more outsourced in each sector represented:

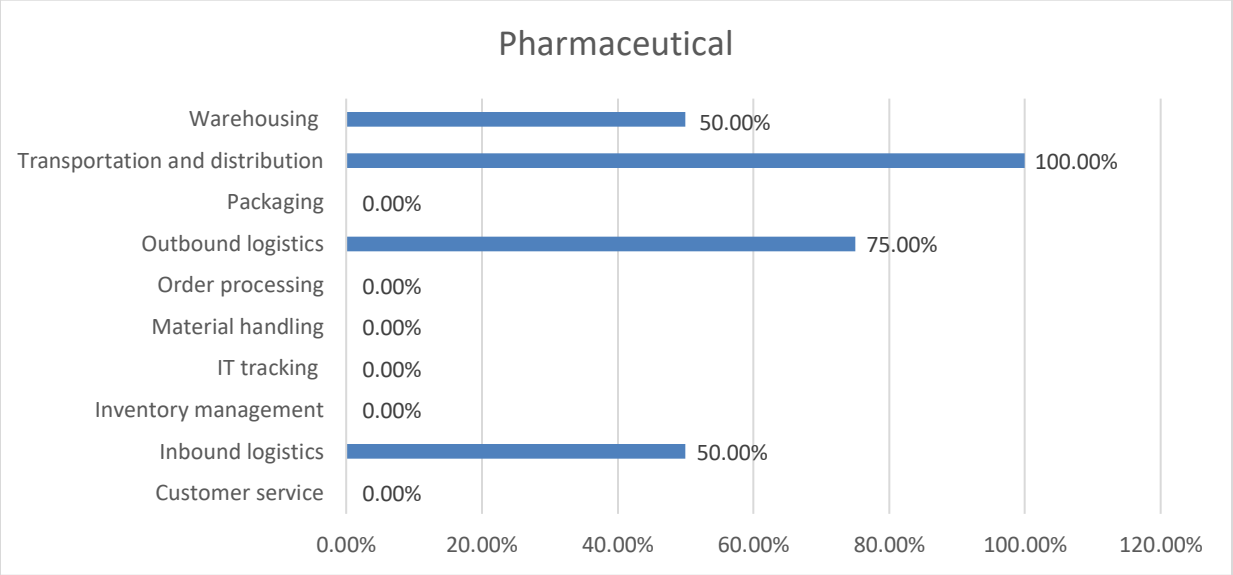


Figure 5.2: Level of logistics outsourcing activity by activity for Pharmaceutical

The bar chart above shows that only warehousing, transportation and distribution, inbound and outbound logistics are outsourced. Three out of the four activities are all transportation related activities and can be classified under Distribution and Transportation management (DTM). The average percentage for the three activities is 75% which indicates high outsourcing of transportation related activities. Warehousing is outsourced but at fifty percent. Other logistics activities are not outsourced. The combined average logistics activities outsourced by the pharmaceutical company is 27.5%. Figure 5.3 below shows the level of logistics activity by activity for Manufacturing.

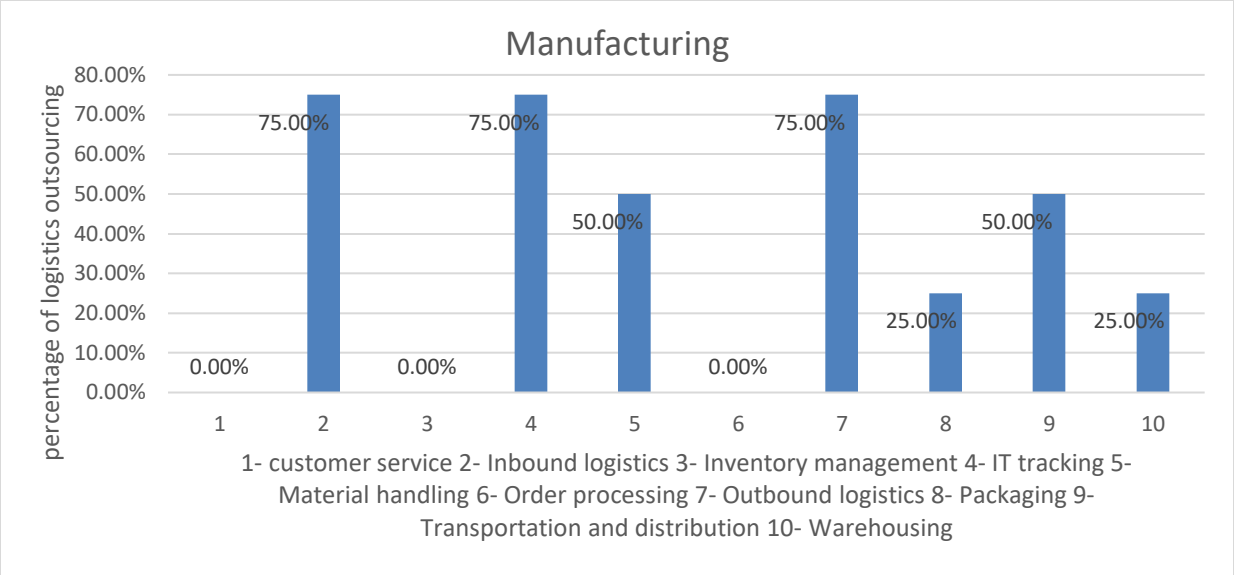


Figure 5.3: Level of logistics outsourcing activity by activity for Manufacturing

Unlike pharmaceutical, the column chart above shows that more logistics activities are outsourced by the Manufacturing company as they are outsourcing seven from the ten activities compared to the pharmaceutical company that outsource only four from the ten activities. Also, the chart shows that inbound and outbound logistics which are transportation related activities are among the three most outsourced logistics activities, the third being IT. This again indicates that transportation related activities are more outsourced by the manufacturing company just like the case of the pharmaceutical company. The average percentage of transportation related activity outsourced is 66.6% which is 8.4% less than the pharmaceutical company. The combined average logistics activities outsourced by the manufacturing company is 37.5%. Figure 5.4 below shows the logistics activities outsourced by Agriculture1 and the percentages of each:

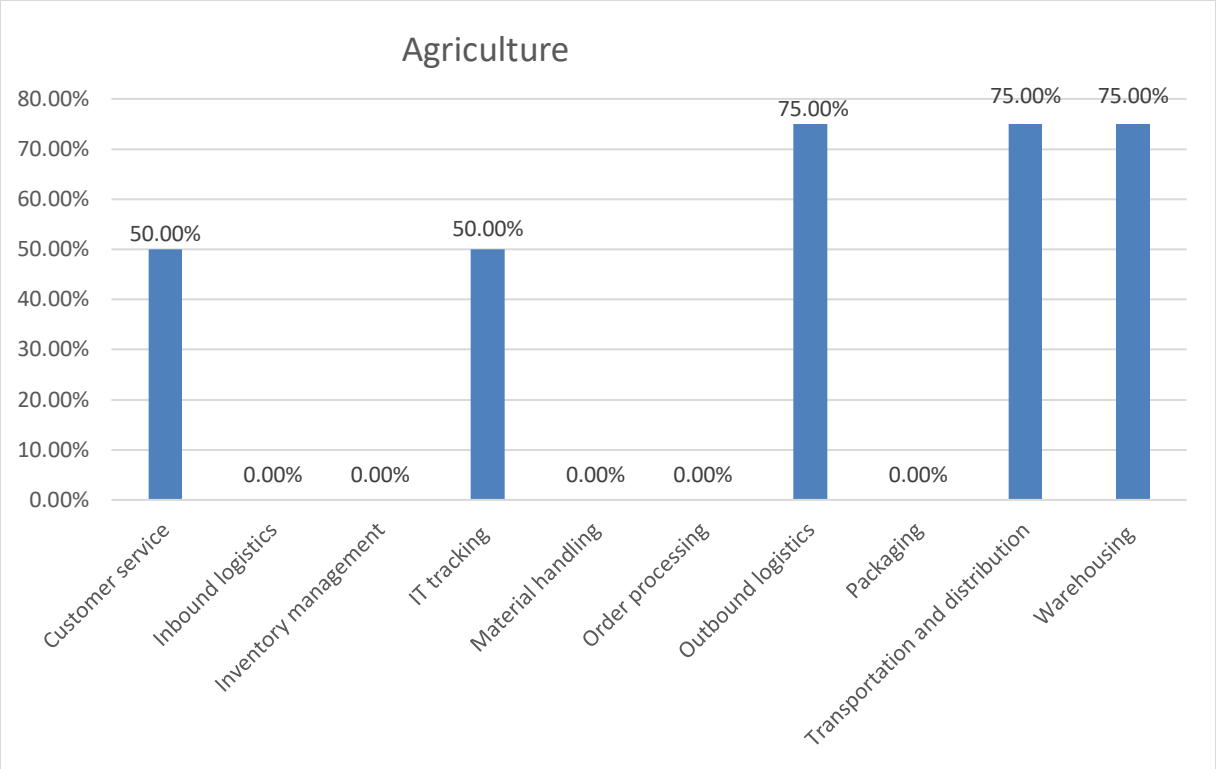


Figure 5.4: Level of logistics outsourcing activity by activity by Agriculture1.

The column chart above again shows that similar to the Pharmaceutical and manufacturing companies, the Agricultural1 outsource more transportation related activities. Two of the three most outsourced logistics activities at 75% each are outbound and transportation and distribution management, the third being warehousing. However, unlike the pharmaceutical company, the average transportation related activity that is outsourced is 50% which is 25% less than pharmaceutical. Also, while no single activity is fully outsourced, the company outsource one more logistics activity than the pharmaceutical company and one less logistics activity compared to the manufacturing company. The combined average percentage of logistics activities outsourced by the Agriculture1 is 32.5%. Figure 5.5 below shows the logistics activities outsourced by the Agriculture2 and their percentages:

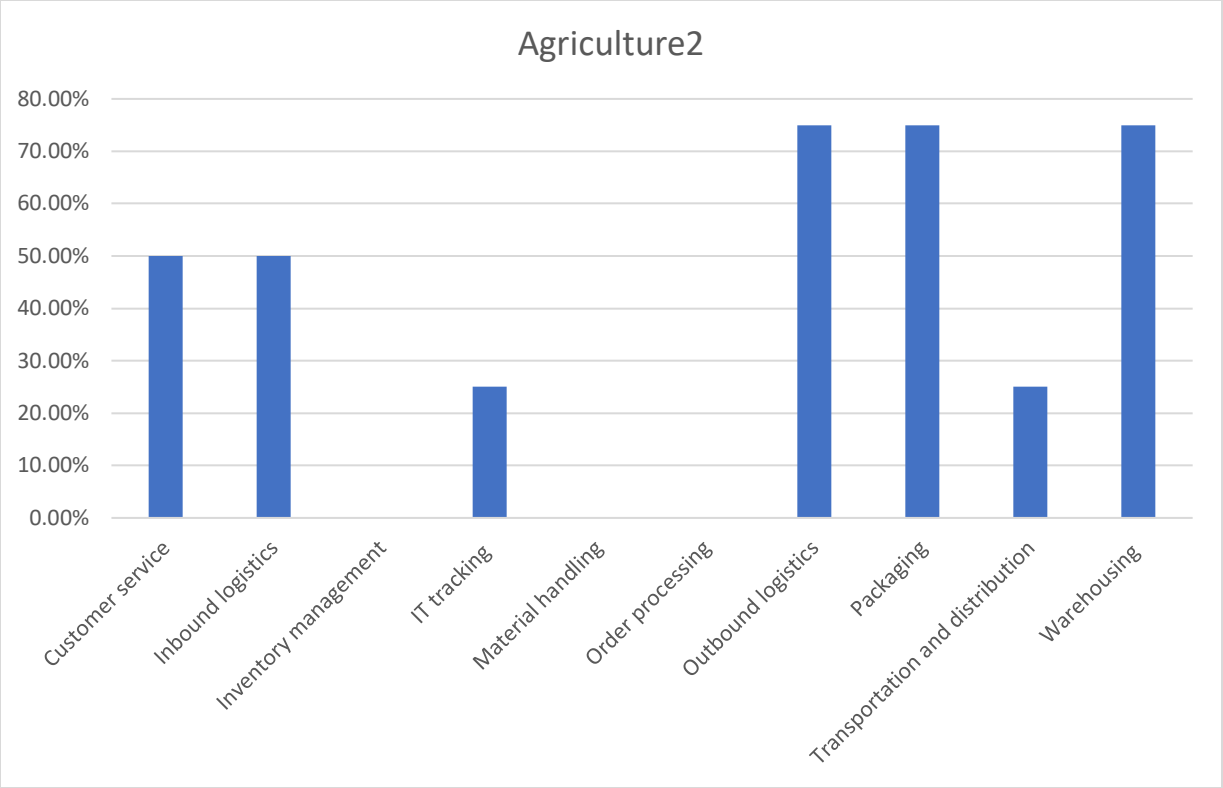


Figure 5.5: Level of logistics outsourcing activity by activity by Agriculture2.

Again, the column chart above again shows that outbound logistics (last mile delivery) are among the three most outsourced logistics activity by Agriculture2. In this case however only one transportation related activity is outsourced compared to other companies where two transportation related activities have been among the three most outsourced logistics activities. Also, it is interesting to note that warehousing is among the three most outsourced logistics activities just like the case with Agriculture1 at 75% level. This tentatively indicates that warehousing is well outsourced in the Nigerian agricultural sector. The combined average percentage of logistics activities outsourced by Agriculture2 is 37.5%. Figure 5.6 below shows the logistics activities outsourced by the FMCG company:

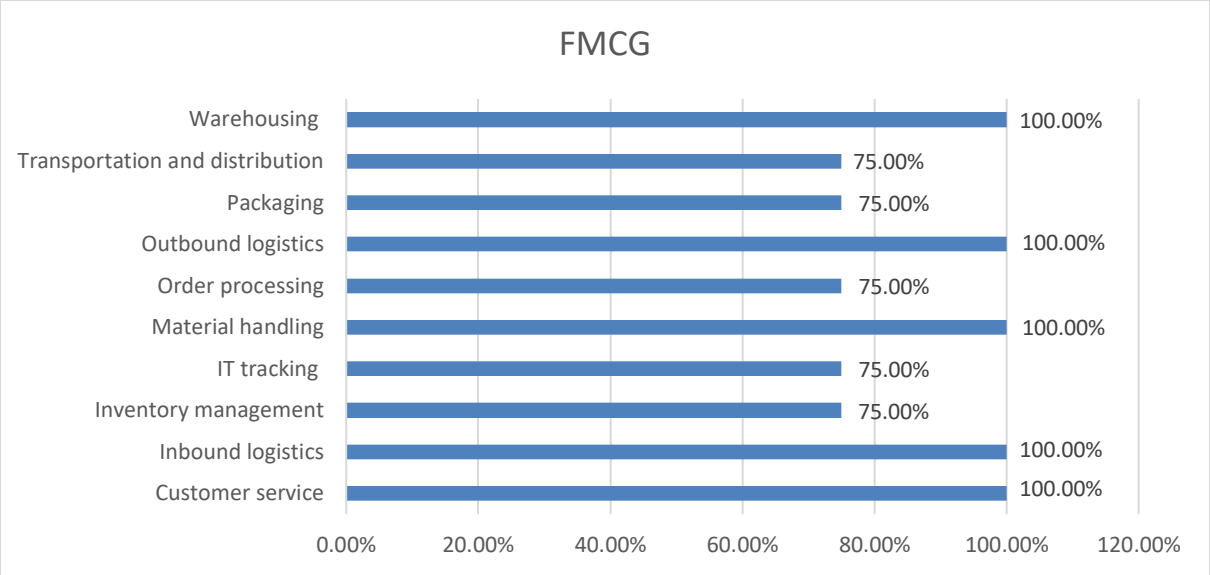


Figure 5.6: Level of logistics outsourcing activity by activity by FMCG.

The bar chart above shows that the FMCG is the only company that is outsourcing all of their logistics activities. It also shows that the lowest percentage of outsourcing for each activity is 75%. Five activities are outsourced at 75% and five other activities re outsourced at 100%. Again, two of the five activities outsourced at 100% are transportation related activities namely outbound and inbound logistics. This therefore indicates that outbound logistics is always among the most outsourced logistics activities across all sectors represented. Also, similar to the agricultural sector, warehousing is among the most outsourced by the FMCG at 100%. The combined percentage of logistics activities outsourced by the FMCG is 87.5% which is far higher than the others as the second highest combined average is at 37.5% (manufacturing and agriculture2). The pharmaceutical company has the lowest percentage of combined average at 27.5%.

5.5.3 Logistics Outsourcing and Performance

Figure 5.7, a clustered column chart below shows the comparative expert opinion on the impact of logistics outsourcing on each logistics activity. The data was collected using Likert scale

questionnaire on the scale of 1 to 5 where 5 refers to extremely high performance and 1 refers to extremely low performance. Then 3 refers to a neutral position where the expert is not sure about the impact of outsourcing on the particular logistics activity. It is important to note that 3 does not mean a higher level of performance than 2 rather it means that the expert was not sure about how much impact outsourcing has made on the logistics activity. An option for zero value means not applicable (N/A) which means that the company did not outsource that particular logistics activity hence there is no way they could have measured the performance of the logistics activity based on outsourcing.

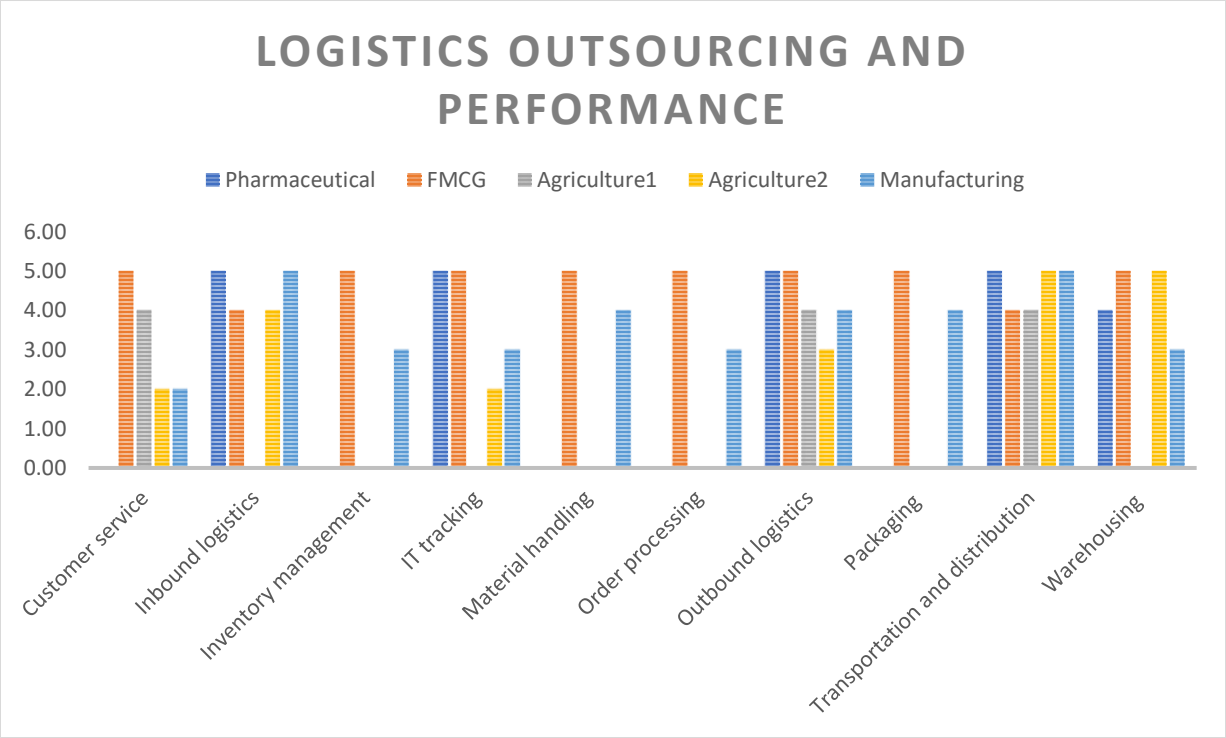


Figure 5.7: Clustered column chart above showing expert opinion on the impact of logistics outsourcing on the performance of each outsourced logistics activity.

The clustered column chart above again shows that the FMCG company believes that logistics outsourcing enables the logistics activities to perform very well. All response from the FMCG is either 5 (extremely high performance) or 4 (high performance). Also, eight out of their ten

response, is 5 (extremely high performance). The chart also shows that the manufacturing company holds quite a number of neutral positions on the various logistics activities such as inventory management, IT tracking, order processing and warehousing. Aside from manufacturing, Agriculture2 also had a neutral position which is regarding outbound logistics. Another important point to note is that transportation related activities such as inbound logistics, outbound logistics and transportation and distribution had the most positive response from the experts on the impact of outsourcing. In particular, the pharmaceutical company responded with 5 that is extremely high performance of outsourcing on all three transportation related activities.

5.5.4 Logistics Outsourcing and Cost Efficiency

Figures 5.8 to 5.12 are pivot charts each describing the frequency of occurrence of the various percentage values. The percentage values represent how much cost savings is enabled by logistics outsourcing according to the opinion of the experts. The summary of the various percentages across the sectors represented and their interpretations are attached in the appendix. The data was collected using structured questionnaire with predetermined percentage values as answers. Figure 5.8 below represents expert opinion from the manufacturing company:

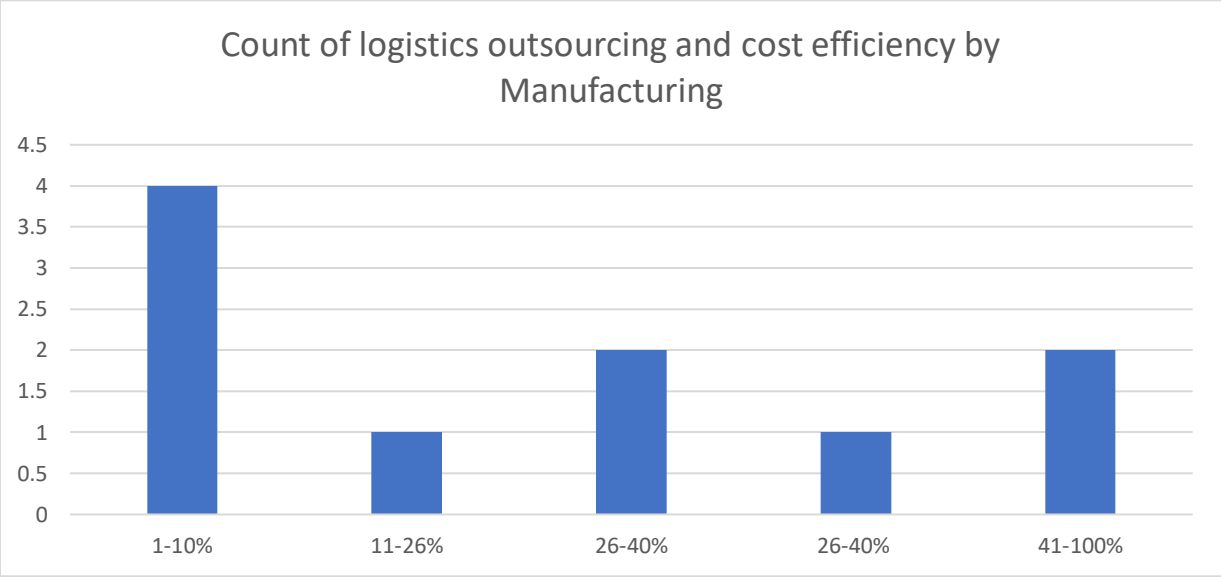


Figure 5.8: Count of the various percentage range of cost savings according to the opinion of the manufacturing company.

The pivot chart shows that cost savings between 1-10% which means low-cost savings is the highest occurring percentage range at four times. The percentage range of 41-100% which means very high-cost savings occurs twice. The percentage range of 26-40% which means high-cost savings occurs three times while the percentage range of 11-26% which means medium cost savings occurs once. This indicates that the opinion of the expert on cost savings is moderately positive as there are five high to very high-cost savings indicated and five low to medium cost savings indicated. Figure 5.9 below shows the count of the various percentage range of cost savings on FMCG's logistics activities because of logistics outsourcing:

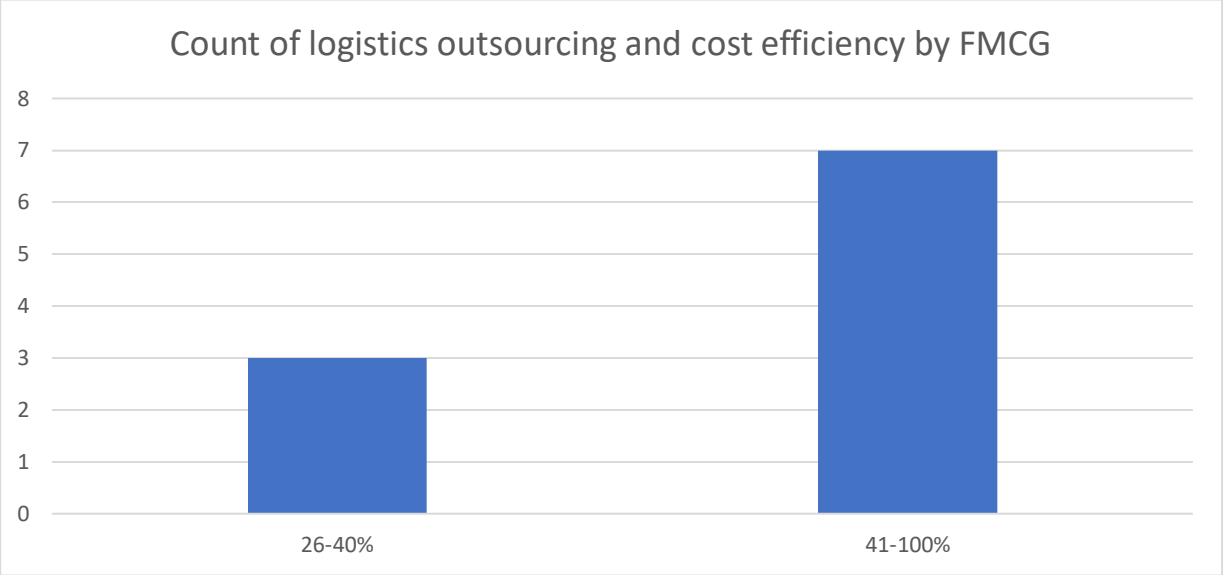


Figure 5.9: Count of the various Percentage range of cost savings on the logistics activities of FMCG.

The pivot chart above shows that 41-100% (very high-cost savings) occurs 7 times and 26-40% (high-cost savings) occurs 3 times. There are no other percentage range represented. The foregoing indicates that the FMCG's expert has an extremely positive opinion on the impact of

logistics outsourcing on logistics cost savings. Figure 5.10 below shows the opinion of the pharmaceutical expert on cost savings resulting from logistics outsourcing:

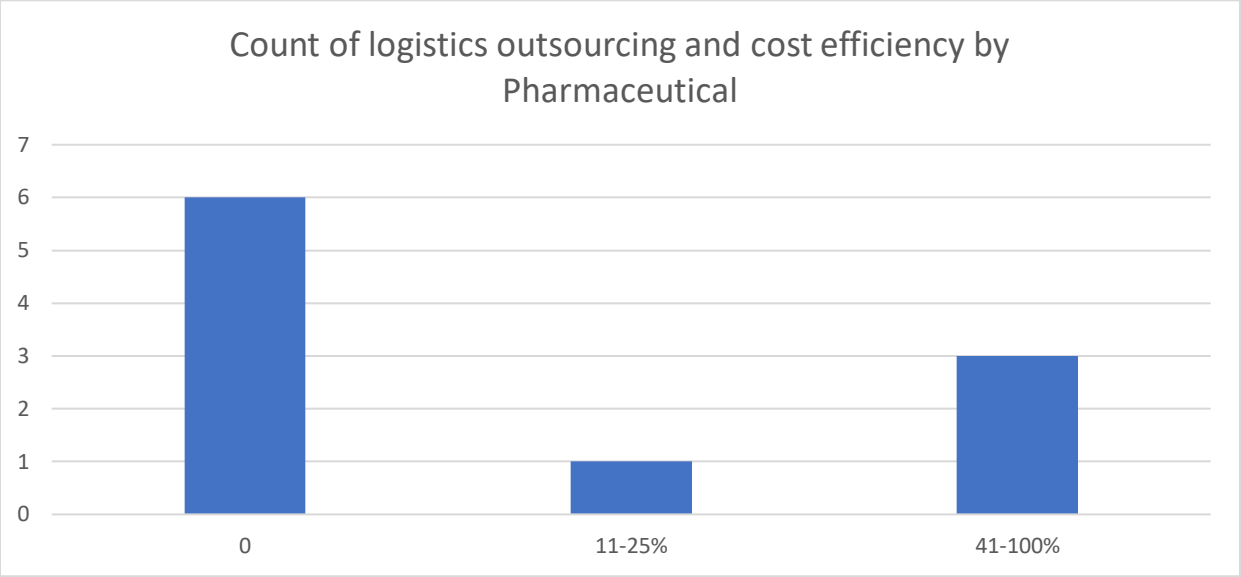


Figure 5.10: Count of the various Percentage range of logistics cost savings from outsourcing as perceived by pharmaceutical company.

The pivot chart above indicates that there are 6 counts of zero because these logistics activities are not outsourced by the pharmaceutical company. However, from the 4 outsourced logistics activities, 3 are perceived to be in the range of 41-100% (very high) cost savings from outsourcing and the other perceived to be in the percentage range of 11-25% (medium) cost savings. This indicates a very positive opinion on the impact of outsourcing on cost savings of outsourced logistics activities as 75% of outsourced logistics activities are perceived to be in the range of very high-cost savings. Figure 5.11 below shows the opinion of the Agriculture1 on cost saving:

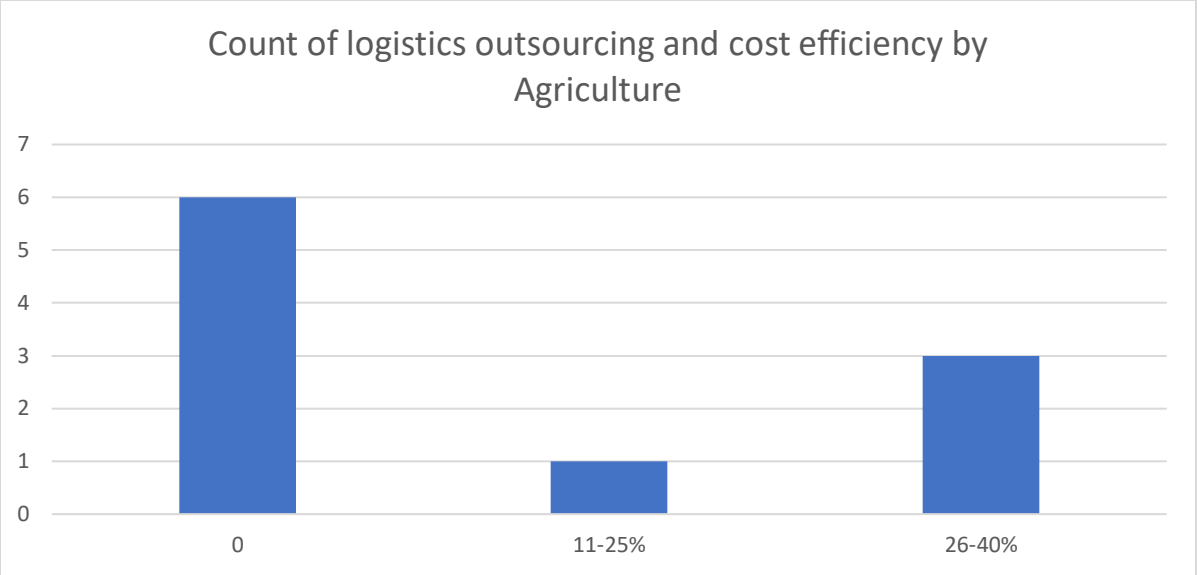


Figure 5.11: Count of the various percentage range of cost savings on outsourced logistics activities as perceived by agriculture.

Similar to the pharmaceutical company, the agriculture1 has 6 counts of zero because these activities are not outsourced. Also, similarly to the pharmaceutical company, the agricultural expert believes strongly that outsourcing of logistics activities saves a lot of cost as 75% of outsourced logistics activities are within the range of very high-cost savings. Figure 5.12 shows the opinion of the expert from the second agricultural company.

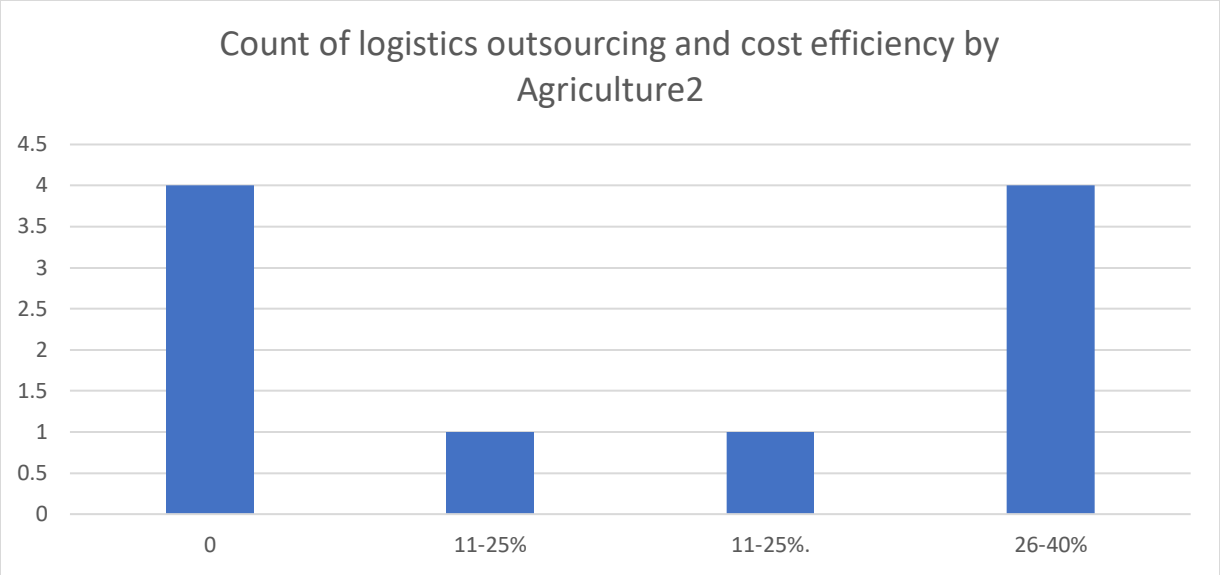


Figure 5.12: Count of the various percentage range of cost savings as perceived by agriculture2.

The pivot chart indicates 4 counts of zero because more logistics activities are outsourced compared to Agriculture1 and the Pharmaceutical company both of which has 4 counts of zero. Then of the six outsourced logistics activities, 4 counts of high cost saving within 26-40% range and 2 counts of medium cost savings within 11-25% range. The opinion of the second agricultural company expert is moderately positive as 2/3 of the outsourced activities are perceived to be in the range of high-cost savings. Table 5.13 below shows a summary of the responses of the various experts.

Table 5.15: summary of data from experts on logistics outsourcing and cost efficiency.

logistics outsourcing and cost efficiency	Pharmaceutical	FMCG	Agriculture	Agriculture 2	Manufacturing
Customer service	0%	41-100%	11-25%	26-40%	1-10%
Inbound and outbound logistics	41-100%	26-40%	0%	11-25%.	26-40%

Inventory management	0%	41-100%	0%	0%	1-10%
IT tracking	0%	26-40%	0%	11-25%	41-100%
Materials handling	0%	26-40%	0%	0%	26-40%
Order processing	0%	41-100%	0%	0%	1-10%
Outbound logistics	41-100%	41-100%	26-40%	26-40%	26-40%
Packaging	0%	41-100%	0%	0%	41-100%
Transportation and distribution	41-100%	41-100%	26-40%	26-40%	11-26%
Warehousing	11-25%	41-100%	26-40%	26-40%	1-10%

First, the excel table highlights the zero values in green colour code making it easy for the reader to see which organisations have the zero values represented as cost savings from outsourcing the various logistics activities. The green colour coding shows that pharmacy, and the two agricultural companies all have zero values because the logistics activities either because the logistics activities were not outsourced, or they did not yield any savings in cost. The excel table above also shows that all three 41-100 percentage range of cost savings indicated by the pharmaceutical expert are transportation related activities. Also, both agricultural companies indicated high-cost savings (26-40%) for outbound logistics activities, transportation and distribution and warehousing. While the manufacturing company indicated

very high-cost savings for IT and packaging and high-cost savings for inbound and outbound logistics both of which are transportation related activities.

5.5.5 Third-party logistics modern technology and operations efficiency and customer satisfaction

The experts were asked about their opinion on whether the use of modern technology affects operational efficiency and customer (third-party logistics customers) satisfaction positively. Likert scale questionnaire was used with five points which is from the scale of 1 to 5, where 1 means strongly disagree and 5 means strongly agree and 3 means neither agree nor disagree that is a neutral position. An option for 0 means that the third-party logistics company do not use modern technology. Figure 5.13 below which is a clustered bar chart, summarises and compare the response of the experts across the sectors represented:

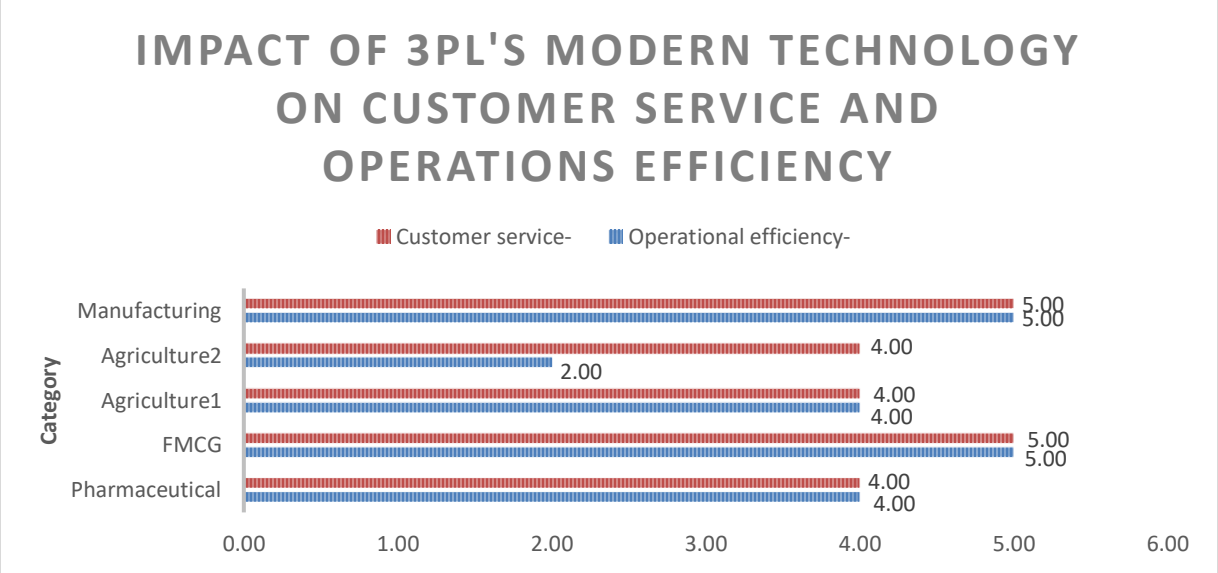


Figure 5.13: Clustered bar chart above summarizing the response of the experts across the sectors represented.

Again, the FMCG expert is very positive about the impact of modern technology on operational efficiency and customer service which shows a trend of positive responses from the FMCG

expert. The manufacturing company expert also shows maximum positive response, and this can be linked to their response on how much cost savings logistics outsourcing makes on IT as seen in figure 5.12. Agriculture 2 expert is not positive on the use of modern technology by third party logistics affecting operations efficiency positively. Overall, on the average, the scores awarded to the impact of 3PL's modern technology on operations efficiency and customer service is 8.4 score out of 10. Further analysis showed that 4.4 average score out of 5 is awarded to the impact of 3PL's modern technology on customer service and 4.0 average score out of 5 is awarded to the impact of modern technology on operations efficiency.

Figure 5.14 below is a pie chart that compares how much percentage of the total positive responses on operations efficiency are represented by each sector:

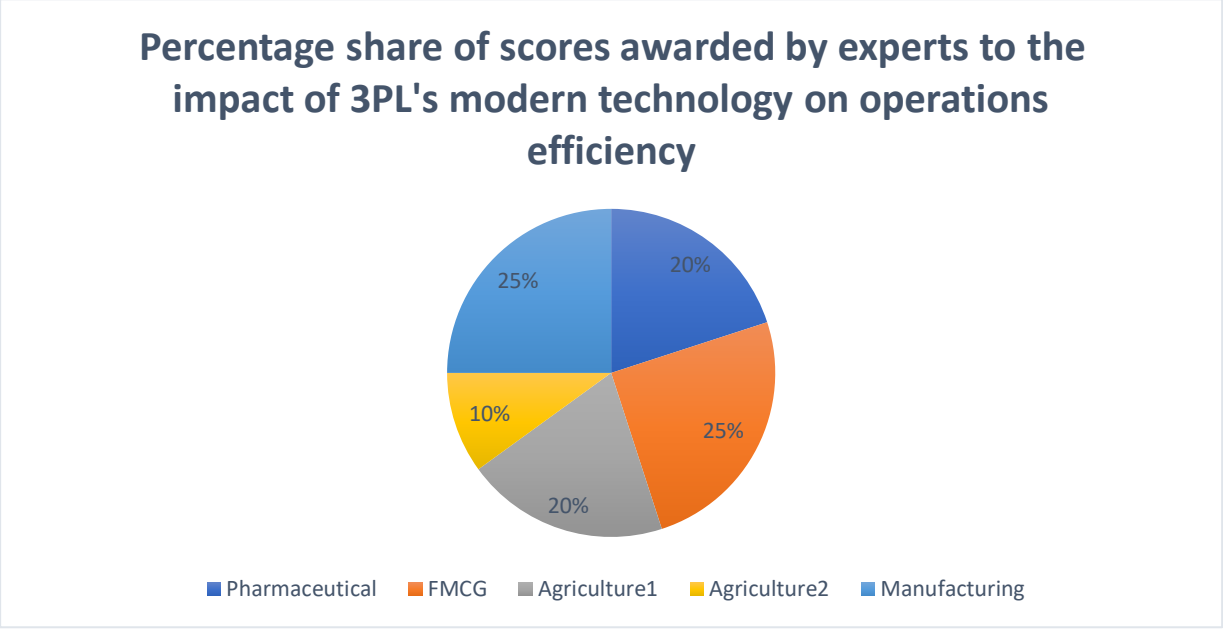


Figure 5.14: Pie chart showing the percentage share of each expert's score to the impact of 3PL's modern technology to operations efficiency.

The pie chart shows that FMCG and manufacturing companies have the highest share while agriculture 2 has the lowest share as noted earlier in figure 5.13. Figure 5.15 below is a pie

chart that compares the how much percentage of the total positive responses on customer satisfaction are represented by each sector:

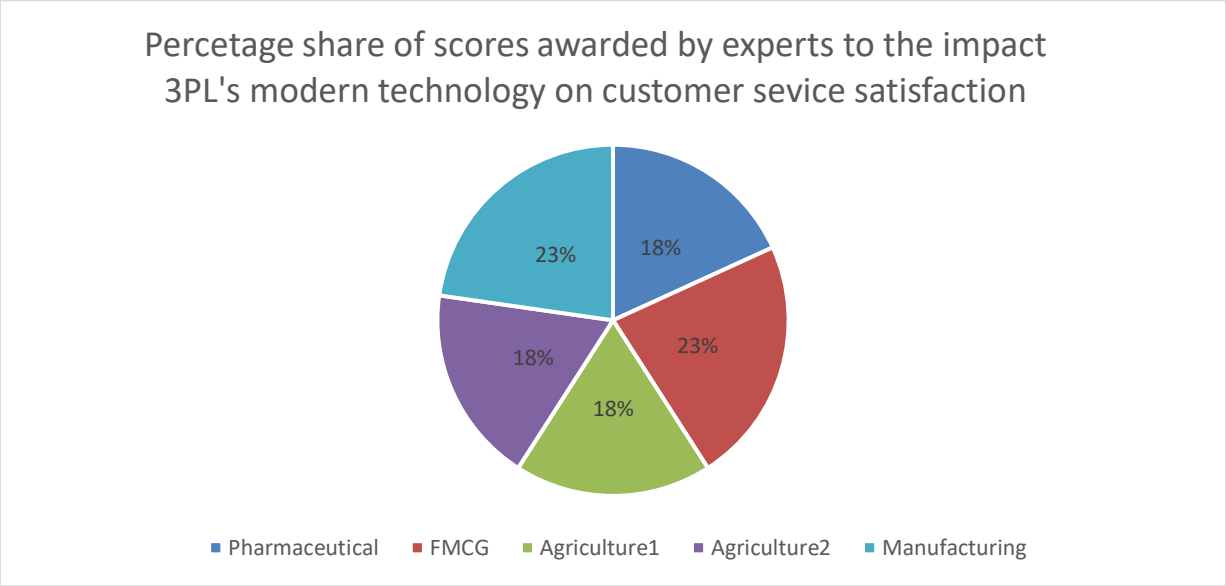


Figure 5.15: Percentage share of positive responses from experts on 3PL modern technology and customer service satisfaction.

Again, similar trend is observed from the pie chart above where FMCG and manufacturing have the highest share of total positive response compared to other sectors represented as is the case in figure 5.14. Figure 5.16 below is a column chart comparing the levels of outsourcing of the various logistics activities by the customers of the third-party logistics company.

5.5.6 Outsourcing demand of each logistics activity from the 3PL customers

Figure 5.16: Column chart showing the level of outsourcing demand on the various logistics activities by the 3PL customers.

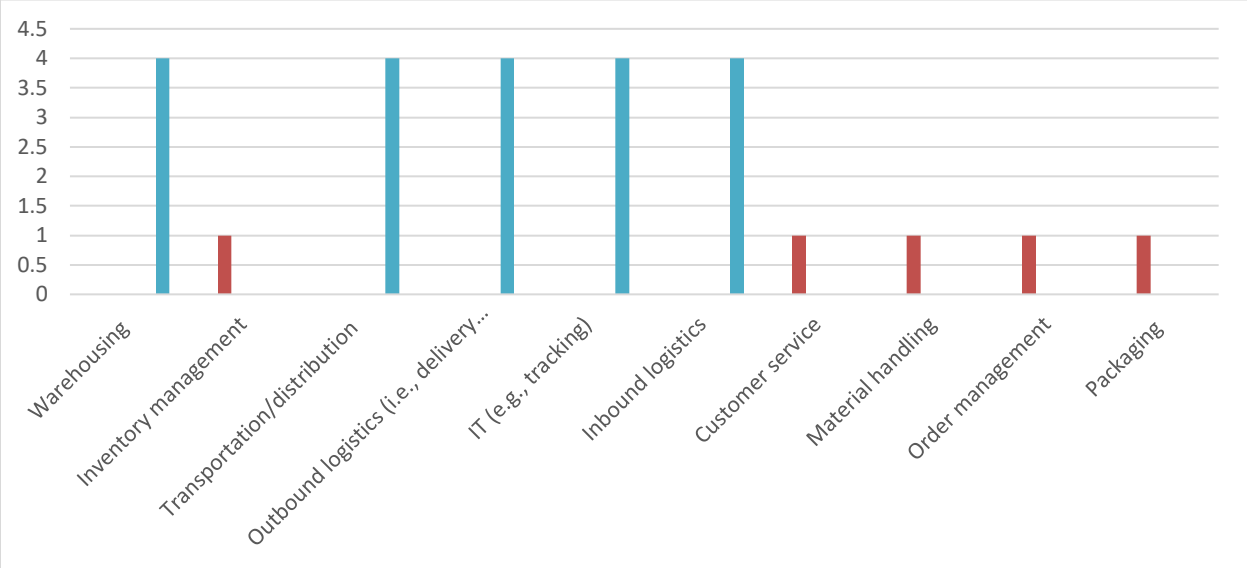


Figure 5.16: Column chart showing the level of outsourcing demand on the various logistics activities by the 3PL customers.

Again, the column chart above shows that transportation related activities such as transportation and distribution, outbound logistics and inbound logistics are all fully outsourced. It also shows that order management and inventory management are outsourced at a low level along with packaging, material handling and customer service which is like the response from other participating organisations. However, the response from other participating organisations shows that inventory and order management are the lowest outsourced logistics significantly lower than material handling, customer service and packaging. Warehousing (storage and management) is outsourced fully which is similar with the response from the other participating organisations. However, contrary to the other participating organisation, the 3PL company

indicates that IT (such as tracking) is fully outsourced whereas the other participating organisations indicate that IT is outsourced at a medium level.

5.6 STASTISTICAL T-TEST

5.6.1 Purpose of T-test on primary data

This section will perform a T-test on the primary data collected from companies who outsource logistics functions in Nigeria. The purpose of performing the T-test on the primary data is to compare the data on the various logistics activities across all sectors represented to determine if the difference in the mean of each logistics activity is statistically significant. (Collis and Hussey, 2021). The comparison will establish which logistics activity is outsourced more than the other across sectors represented. The comparison will also establish which logistics activity is most outsourced and which is least outsourced. Again, as mentioned in the methodology chapter, t-test was used instead of ANOVA because the data sample is small. Collis and Hussey (2021) argued that t-test is recommended for data samples below 30. While ANOVA is suitable for data groups of 3 or more as is the case with this data, however each group is required to be a minimum of at least 15 which is not the case with this data. T-test on the other hand is used for small parametric data sample and the test is carried out on only two data sample each time. Two data sample with equal variance is used in this analysis because the t-test aims to test the assumption that the mean of each data sample is equal to the other. Two data sample with equal variance is also used because the distribution is normal- that is the number of observations is the same for both data samples (Bell et al., 2022).

The definitions of statistical t-test terms are laid out in appendix 3

5.6.2 Population and data sample

The population is every organization including SMEs and large corporations from various sectors in Nigeria who are engaged in logistics activities. Five data samples were collected from five organizations representing four sectors namely: pharmaceutical (pharma manufacturing), agriculture, manufacturing/trading, and FMCG/manufacturing. The variables are eleven logistics activities. Data collected from the five organisations in Nigeria about the level of logistics outsourcing will be compared against each other to establish whether the difference in the mean value of each is statistically significant. The tests were done using excel software.

5.6.3 T-test results

Number of tests performed: 45.

Number of tests that are statistically significant: 9.

Null hypothesis was accepted in 36 tests.

Table 5.16: statistically significant test results- The statistically significant tests are summarized in the table below:

No	Two sample t-test statistics variables	Mean of variables	p-value significance level	Decision
1.	DTM & inventory management	DTM $\dot{X}$ is 65. Inv. Mgt. $\dot{X}$ is 15	First tail 0.017 Second tail 0.034	Null hypothesis rejected
2.	DTM & order management	DTM $\dot{X}$ is 65.	First tail 0.017	Null hypothesis rejected

		Order Mgt. $\dot{X}$ is 15	Second tail 0.034	
3.	Warehousing & inventory management	Warehousing $\dot{X}$ is 75. Inv. Mgt. $\dot{X}$ is 15	First tail 0.003 Second tail 0.007	Null hypothesis rejected
4.	Warehousing & order management	Warehousing $\dot{X}$ is 75. Order Mgt. $\dot{X}$ is 15	First tail 0.003 Second tail 0.007	Null hypothesis rejected
5.	Outbound logistics & inventory management	Outbound logistics $\dot{X}$ is 80. Inv. Mgt. $\dot{X}$ is 15	First tail 0.0016 Second tail 0.0033	Null hypothesis rejected
6.	Outbound logistics & IT tracking	Outbound logistics $\dot{X}$ is 80. IT tracking $\dot{X}$ is 45.	First tail 0.02 Second tail 0.05	Null hypothesis rejected

7.	Outbound logistics & material handling	Outbound logistics Ẋ is 80. Material handling Ẋ is 30	First tail 0.02 Second tail 0.04	Null hypothesis rejected
8.	Outbound logistics & order management	Outbound logistics Ẋ is 80. Order mgt. is 15	First tail 0.0016 Second tail 0.0033	Null hypothesis rejected
9.	Outbound logistics & packaging	Outbound logistics Ẋ is 80. Packaging is 35	First tail 0.017 Second tail 0.034	Null hypothesis rejected

Below is a screenshot that shows the statistical t-test result for DTM and inventory management in excel. This is an example result that shows that all the results were obtained by using the statistical t-test function in excel to work out the results. This was done by inputting all values representing DTM in column F1-F5 (F6= Average) and values representing inventory management in column G1-G5 (G6= Average) and copying both and then select the Data tab from the top bar menu and afterwards selecting Data Analysis in the top right-hand corner and selecting t-Test: Two Sample Assuming Equal Variance in the open dialogue as seen in the screenshot, figure 5.17 below:

Figure 5.17 above showing how DTM, and inventory management statistically significant t-test result was worked out.

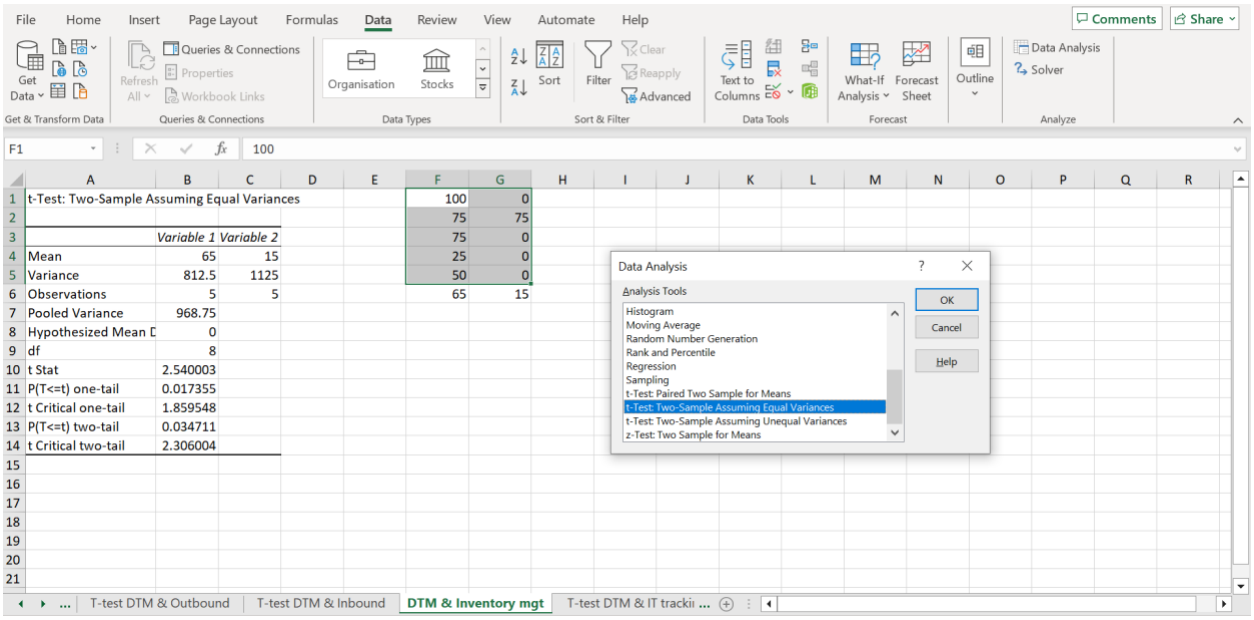


Table 5.17 below shows the 36 tests that were not statistically significant in which cases the null hypotheses were accepted.

Table 5.17: t-test results that are not statistically significant- T-test results that are not statistically significant

No	Two sample t-test variables	Mean of variables	p-value significance level	Decision
1.	DTM and Warehousing	DTM $\dot{X}$ is 65. Warehousing $\dot{X}$ is 75	Tail one 0.32 Tail two 0.64	Null hypothesis accepted
2.	DTM & Outbound logistics	DTM $\dot{X}$ is 65. Outbound logistics $\dot{X}$ is 80	Tail one 0.15 Tail two 0.30	Null hypothesis accepted
3.	DTM & Inbound logistics	DTM $\dot{X}$ is 65.	Tail one 0.32	Null hypothesis accepted

		Inbound logistics $\dot{X}$ is 55	Tail two 0.64	
4.	DTM & IT tracking	DTM $\dot{X}$ is 65. IT tracking $\dot{X}$ is 45	Tail one 0.16 Tail two 0.32	Null hypothesis accepted
5.	DTM & customer service	DTM $\dot{X}$ is 65. Customer service $\dot{X}$ is 40	Tail one 0.15 Tail two 0.30	Null hypothesis accepted
6.	DTM & Material handling	DTM $\dot{X}$ is 65. Material handling $\dot{X}$ is 30	Tail one 0.08 Tail two 0.17	Null hypothesis accepted
7.	DTM & packaging	DTM $\dot{X}$ is 65. Packaging $\dot{X}$ is 35	Tail one 0.09 Tail two 0.19	Null hypothesis accepted
8.	Warehousing & Outbound logistics	Warehouse $\dot{X}$ is 75 and outbound logistics $\dot{X}$ is 80	Tail one 0.30 Tail two 0.60	Null hypothesis accepted
9.	Warehousing & Inbound logistics	Warehouse $\dot{X}$ is 75 and inbound logistics $\dot{X}$ is 55	Tail one 0.15 Tail two 0.30	Null hypothesis accepted
10.	Warehousing & IT tracking	Warehouse $\dot{X}$ is 75. IT tracking $\dot{X}$ is 45	Tail one 0.05 Tail two 0.10	Null hypothesis accepted

11.	Warehousing & customer service	Warehouse $\dot{X}$ is 75. Customer service $\dot{X}$ is 40	Tail one 0.06 Tail two 0.12	Null hypothesis
12.	DTM & Material handling	DTM $\dot{X}$ is 65. Material handling $\dot{X}$ is 30	Tail one 0.08 Tail two 0.17	Null hypothesis
13.	Warehousing & packaging	Outbound logistics $\dot{X}$ is 80. packaging $\dot{X}$ is 35	Tail one 0.03 Tail two 0.06	Null hypothesis
14.	Outbound logistics & Inbound logistics	Outbound logistics $\dot{X}$ is 80. Inbound logistics $\dot{X}$ is 55	Tail one 0.09 Tail two 0.18	Null hypothesis
15.	Outbound logistics & customer service	Outbound logistics $\dot{X}$ is 80. Customer service $\dot{X}$ is 40	Tail one 0.03 Tail two 0.07	Null hypothesis
16.	Inbound logistics & inventory management	Inbound logistics $\dot{X}$ is 55. Inv. Mgt. $\dot{X}$ is 15	Tail one 0.05 Tail two 0.11	Null hypothesis

17.	Inbound logistics & IT tracking	Inbound logistics $\dot{X}$ is 55. IT tracking $\dot{X}$ is 45	Tail 0.33 Tail two 0.66	Null hypothesis
18.	Inbound logistics & customer service	Inbound logistics $\dot{X}$ is 55. Customer service $\dot{X}$ is 40	Tail one 0.28 Tail two 0.56	Null hypothesis
19.	Inbound logistics & material handling	Inbound logistics $\dot{X}$ is 55. Material handling $\dot{X}$ is 30	Tail one 0.18 Tail two 0.36	Null hypothesis
20.	Inbound logistics & order management	Inbound logistics $\dot{X}$ is 55. Order Mgt. $\dot{X}$ is 15	Tail one 0.05 Tail two 0.11	Null hypothesis
21.	Inbound logistics & packaging	Inbound logistics $\dot{X}$ is 55. Packaging $\dot{X}$ is 35	Tail one 0.21 Tail two 0.42	Null hypothesis
22.	Inventory management & IT tracking	Inv. Mgt. $\dot{X}$ is 15. IT tracking $\dot{X}$ is 45	Tail one 0.09 Tail two 0.18	Null hypothesis
23.	Inventory management & customer service	Inv. Mgt. $\dot{X}$ is 15. Customer serv. $\dot{X}$ is 40	Tail one 0.16 Tail two 0.32	Null hypothesis is accepted

24.	Inventory management & material handling	Inv. Mgt. $\dot{X}$ is 15. Material handling $\dot{X}$ is 30	Tail one 0.28 Tail two 0.56	Null hypothesis is accepted
25.	Inventory management & order management	Inv. Mgt. $\dot{X}$ is 15. Order mgt. is 15	Tail one 0.5 Tail two is 1	Null hypothesis is accepted
26.	Inventory management & packaging	Inv. Mgt. $\dot{X}$ is 15. Packaging is 35	Tail one 0.20 Tail two 0.40	Null hypothesis accepted
27.	IT tracking & customer service	IT tracking $\dot{X}$ is 45. Customer serv. Is 40	Tail one 0.42 (approximate) Tail two 0.84 (approximate)	Null hypothesis accepted
28.	IT tracking & material handling	IT tracking $\dot{X}$ is 45. Material $\dot{X}$ is 30	Tail one 0.28 Tail two 0.56	Null hypothesis accepted
29.	IT tracking & order management	IT tracking $\dot{X}$ is 45. Order mgt. $\dot{X}$ is 15	Tail one 0.09 Tail two 0.18	Null hypothesis is accepted
30.	IT tracking & packaging	IT tracking $\dot{X}$ is 45. Packaging $\dot{X}$ is 35	Tail one 0.33 Tail two 0.66	Null hypothesis is accepted
31.	Customer service & material handling	Customer service $\dot{X}$ is 40.	Tail one 0.36 Tail two 0.72	Null hypothesis is accepted

		Material handling $\dot{X}$ is 30		
32.	Customer service & order management	Customer service $\dot{X}$ is 40. Order management $\dot{X}$ is 15	Tail one 0.16 Tail two 0.32	Null hypothesis is accepted
33.	Customer service & packaging	Customer service $\dot{X}$ is 40. Packaging $\dot{X}$ is 35	Tail one 0.42 Tail two 0.84	Null hypothesis is accepted
34.	Material handling & order management	Material handling $\dot{X}$ is 30. Order management $\dot{X}$ is 15	Tail one 0.28 Tail two 0.56	Null hypothesis is accepted
35.	Material handling & packaging	Material handling $\dot{X}$ is 30. Packaging $\dot{X}$ is 35	Tail one 0.426 Tail two 0.85	Null hypothesis is accepted
36.	Order management & packaging	Order management $\dot{X}$ is 15. Packaging $\dot{X}$ is 35	Tail one 0.20 Tail two 0.40	Null hypothesis is accepted

The foregoing t-test results from both tables above therefore indicate that distribution and transportation management is outsourced more than inventory management among the

participating companies across the sectors represented. Also, distribution and transportation management are outsourced more than order management among the participating companies across sectors represented.

Warehousing is outsourced more than inventory management among the participating companies across the sectors represented. Also, Warehousing is outsourced more than order management among the participating companies across sectors represented.

Outbound logistics is outsourced more than inventory management, IT (e.g., tracking), material handling, order management, and packaging among the participating companies across sectors represented.

The most outsourced logistics activity among is outbound logistics (which was interpreted to the respondents during the data collection period as the delivery of goods and material products to end customers- that is last mile delivery) with an aggregate mean of 80%.

Warehousing (storage and warehouse management) is second most outsourced logistics activity with an aggregate mean of 75%.

Transportation and distribution management is the third most outsourced logistics activity with an aggregate mean of 65%

Inventory management and order management are the two least outsourced logistics activities with an aggregate mean of 15% each**.**

The results of the data analysis above show some correlations between the data from the 3PL company in section 4.4.5, and the results of the data analysed (both descriptive statistics and t-test) from the other participating organizations from various sectors who use the services of 3PLs. The following similarities can be observed:

- That there is a consensus between the 3PL company and 3PL customers that inventory management and order management are both outsourced at very low levels.

- That there is a consensus between the 3PL company and 3PL customers that warehousing, transportation/distribution management and last mile delivery are among the three most outsourced logistics activities.

- The mean $\dot{X}$ of IT (e.g., tracking) and inbound logistics and data from the 3PL company suggests that these logistics activities are more outsourced than inventory management, materials handling, order management and packaging though this could not be proved by a statistically significant t-test result.

5.7 CORRELATION ANALYSIS

In the correlation analysis, data was collected from Armstrong and Associates (2022) report on Global third-party logistics market region by region. The report laid out the GDPs, (Gross Domestic Product) logistics costs and third-party logistics revenues of various economies according to their geographical region. Then the logistics costs of each economy/region are laid out as a percentage of GDP and the third-party logistics revenue (referred to as 3PL revenue) are laid out as a percentage of logistics costs. The research used these data for variables in the correlation test analysis which will be explained in the later sections.

Also, data was collected from the World Bank database and used as variables in the correlation test analysis which will also be explained in the later sections. These data include the GNI (Gross National Income) per capita of selected countries and some economic and social indicators characterized by the various groups of countries according to their GNI per capita. The correlation assumptions aim to propose a tentative theory that partly explains why logistics outsourcing is more practiced and adopted in developed country contexts compared to developing country contexts. The proposed theory or explanation assumes that part of the

reasons for lower levels of logistics outsourcing in developing countries is because of the inherent inefficient logistics operations in developing countries because of socio-economic limitations. These socio-economic limitations may contribute to factors that deter organizations from outsourcing their logistics activities as the expected benefits of outsourcing to logistics experts (such as cost efficiency) may be reduced or even nullified by these limitations. Hence, organizations may rather keep their logistics activities in-house to manage the associated risks of logistics operations in developing country contexts.

5.7.1 African region

The table below shows the GDP of some major African economics and the percentage of GDP that are logistics cost and the percentage of that logistics costs that are 3PL revenue. It gives an idea of the level of logistics outsourcing in these regions by the percentage of logistics costs that are 3PL revenue and the monetary representation. The foregoing gives an idea of the level of third-party logistics activities going on in these countries. The figures representing logistics costs and 3PL revenues are in US$ billions. Source is from Armstrong and Associates (2022)

Table 5.18: logistics costs, GDP and 3PL revenues of selected African countries, source: Armstrong & associates (2022)

Country	2020 GDP US $ billions	Logistics cost as a percentage of GDP %	2020 Logistics Cost US $ billions	3PL Revenue as a percentage of logistics cost	2020 3PL Revenue US $ billions
Algeria	144.3	16.5%	23.8	7.9%	1.9
Egypt	361.8	8.3%	30.0	8.6%	2.6
Morocco	113.5	15.0%	17.0	8.5%	1.4
Nigeria	429.4	16.1%	69.1	7.4%	5.1
South Africa	302.1	10.9%	32.9	10.4%	3.4

Sudan	34.4	17.5%	6.0	7.6%	0.5
Africa-others	1,023.9	16.1%	165.3	7.8%	12.9
Africa Total	2,409.5	14.3%	344.2	8.1%	27.9

The table above shows that logistics costs as a percentage of GDP is in double digits across most of the countries represented except Egypt. Also, the table shows that 3PL revenue as a percentage of logistics costs are in single digits for most of the countries represented except South Africa which is in double digits however Egypt's 3PL revenue as a percentage of logistics costs is higher in percentage compared to the country's logistics costs as a percentage of GDP. On the other hand, other countries have much lower 3PL revenues as a percentage of logistics costs compared to their logistics costs as a percentage of GDP. It shows that both Egypt and South Africa relatively have higher 3PL revenues which indicate that both countries have higher levels of 3PL activities indicating that much more organizations may be outsourcing their logistics activities in Egypt and South Africa compared to other African countries. Nigeria has one of the highest costs as a percentage of GDP at 16.1% and $69.1 billion in value showing that a lot of logistics activities are going on but with little cost efficiency. However, Nigeria has the lowest 3PL revenue as a percentage of logistics costs at 7.4% which shows low usage of the services of 3PL companies compared to the level of logistics activities going on in the country. The country has the highest 3PL revenue at the value of $5.1 billion but that is only because it has the highest GDP and therefore highest value of logistics costs and 3PL revenue but lowest 3PL revenue as a percentage of logistics costs.

A comparison between the table showing African region and the table showing European region indicates similar trends. The table from the African region indicates also that countries from the African region have higher logistics costs as a percentage of GDP and low 3PL revenue as a percentage of logistics costs except Egypt whose 3PL revenue as a percentage of logistics

costs is slightly higher than its logistics costs as a percentage of GDP. Also, South Africa's 3PL revenue as a percentage of logistics costs is slightly lower than its logistics costs as a percentage of GDP unlike other African countries where the 3PL revenue as a percentage of GDP is significantly lower than the logistics costs as a percentage of GDP. South Africa and Egypt are amongst the most industrialized countries in Africa. Below is the table showing the logistics costs and 3PL revenues in the European region:

5.7.2 European region logistics costs and 3PL revenues

Table 5.19: European region, source: Armstrong & associate (2022)

Country	2020 GDP US billions ($)	Logistics costs as a percentage of GDP	2020 Logistics costs in actual figures US billions ($)	3PL revenue as a percentage of logistics costs	2020 3PL revenue in actual figures US billions ($)
Denmark	352.2	8.8%	30.8	10.5%	3.2
Finland	270.6	8.4%	22.8	10.7%	2.4
France	2,598.9	8.8%	228.2	10.5%	23.8
Germany	3,803.0	8.1%	308.5	10.5%	32.4
Greece	189.3	12.3%	23.4	9.1%	2.1
Hungary	154.6	10.0%	15.5	11.0%	1.7
Ireland	418.7	7.7%	32.4	11.8%	3.8
Italy	1,884.9	9.0%	169.4	10.3%	17.4
Netherlands	909.5	7.4%	67.5	14.6%	9.9
Norway	362.0	8.9%	32.4	10.3%	3.3
Poland	594.2	10.1%	60.3	10.2%	6.1

Portugal	231.3	10.5%	24.4	10.1%	2.5
Romania	247.2	11.6%	28.6	10.1%	2.9
Spain	1,278.2	8.2%	105.0	10.2%	10.7
Sweden	537.6	7.8%	42.2	10.4%	4.4
Switzerland	747.4	8.3%	62.1	10.5%	6.6
United Kingdom	2,711.0	8.5%	230.3	9.8%	22.6
Europe others	649.9	11.0%	71.8	10.0%	7.2

The table above describes the level of logistics activities going on in the European region and the 3PL revenue indicates the level of logistics outsourcing activities going on in Europe. There are a few key points to note from the table above. First, Greece logistics costs as a percentage of GDP is very high at 12.3% (the highest in the region) and the country's 3PL revenue as a percentage of logistics costs is the lowest at 9.1%. The foregoing indicates relatively low logistics outsourcing activities (9.1% 3PL revenue) and low-level cost efficiency in logistics operations (high logistics costs at 12.3%). Second, Netherland's logistics costs as a percentage of GDP are the lowest in the region at 7.4% showing high level cost efficiency in logistics operations but the country's 3PL revenue as a percentage of logistics cost is the highest in the region at 14.6% which indicates high logistics outsourcing activities. Similar figures with Netherlands are observed as a trend among other advanced countries in the table such as Spain, Sweden, Switzerland, United Kingdom, Norway, Italy, France, Germany, Finland, Denmark, and Ireland. On the other hand, similar figures with Greece are observed among relatively less developed economies in the table such as Portugal, Romania, Poland, and Hungary. All with double digits logistics costs as a percentage and relatively low 3PL revenue.

However, Hungary's 3PL revenue is slightly higher than its logistics cost while Poland's 3PL revenue is almost the same with its logistics costs. Based on the foregoing therefore, do organizations in more developed economies have more sufficient logistics operating systems than their less developed counterparts? Is logistics outsourcing correlated with cost efficiencies in logistics operations? The same trend is observed in the table below showing the logistics costs and revenues of 3PLs operating in the North and South American countries:

5.7.3 North and South American region logistics costs and 3PL revenue

Table 5.20: North and South American region, source: Armstrong & associates (2022)

Country	GDP (2020) in US billions ($)	Logistics costs as a percentage of GDP	Logistics costs (2020) in US billions ($)	3PL revenue as a percentage of logistics costs	3PL revenue (2020) in US billions ($)
Canada	1,643.4	9.0%	147.9	10.6%	15.7
Mexico	1,076.2	12.0%	129.1	10.8%	13.9
United States	20.932.8	8.0%	1,674.6	13.8%	231.5
North America others	499.8	14.8%	73.8	8.5%	6.3
North America total	24,152.1	8.4%	2,025.5	13.2%	267.4
Argentina	388.3	12.0%	46.6	9.3%	4.3
Brazil	1,434.1	11.6%	166.4	9.4%	15.6
Chile	252.8	11.5%	29.1	9.8%	2.8
Columbia	271.5	12.5%	33.9	8.6%	2.9

Peru	203.8	12.5%	25.5	8.8%	2.2
Venezuela	47.3	11.9%	5.6	7.4%	0.4
South America others	235.8	15.6%	36.8	8.3%	3.0
South America total	2,833.4	12.1%	343.8	9.1%	31.4

In the North American region advanced economies such as United States and Canada have their logistics costs as a percentage of GDP in single digit of 8.0% and 9.0% respectively in contrast to Mexico (a developing country) with double digits of 12.0%. Also, while United States and Canada have 3Pl revenue as a percentage of logistics of 13.8% and 10.6 respectively, Mexico on the other hand have 3PL revenue of 10.8% slightly higher than Canada which indicates that Mexico's logistics outsourcing is higher when compared to Canada. The foregoing also indicates that Mexico has a relatively significant higher level of logistics outsourcing when compared to other North American states that have an average of 8.5% revenue. The foregoing, however, does not translate to efficiencies in Mexico's logistics operations as is the trend with most economies with higher levels of 3PL revenues. North America others, consisting of countries such as Jamaica, Bahamas, Trinidad & Tobago have an average of 14.8% logistics cost as a percentage of GDP indicating inefficiencies in logistics operations and an average of 8.5% 3PL revenue as a percentage of logistics costs indicating low levels of logistics outsourcing.

In South American region, all the countries have high logistics costs of double digits as a percentage of GDP indicating inefficiencies in logistics operations and single digit 3PL revenue as a percentage of logistics costs indicating low levels of logistics outsourcing. Also, interesting

to note that Chile which according to IDESA (2014) is the most developed economy in Latin America have the most efficient logistics operation in the region with 11.5% logistics costs as a percentage of GDP (lowest in the region) and the highest levels of logistics outsourcing at 9.8% 3PL revenue as a percentage of logistics costs (highest in the region). The same trend is observed in other regions is observed in the table below for South Asia Pacific:

5.7.4 South Asia Pacific and CIS Eastern Europe region logistics costs and 3PL revenue

Table 5.21: south pacific Asia and cis eastern Europe, source: Armstrong & associates (2022)

Country	GDP (2020) in US billions ($)	Logistics costs as a percentage of GDP	Logistics costs (2020) in US billions ($)	3PL revenue as a percentage of logistics cost	3PL revenue (2020) in US billions
Australia	1,359.3	8.6%	116.9	10.6%	12.4
Bangladesh	329.1	15.6%	51.3	8.3%	4.3
Brunei Darussalam	12.0	15.0%	1.8	8.5%	0.2
Cambodia	26.0	16.4%	4.3	8.0%	0.3
China	14,722.8	14.5%	2,134.8	10.6%	227.4
Hong Kong	349.4	8.5%	29.7	11.5%	3.4
India	2,708.8	13.0%	351.8	7.4%	26.0
Indonesia	1,059	22.0%	233.1	7.7%	18.0
Japan	5,048.7	8.5%	429.1	10.9%	46.8%
Lao P.D.R	19.1	17.7%	3.4	7.5%	0.3
Macao SAR	24.3	10.0%	2.4	10.3%	0.3
Malaysia	338.3	13.0%	44.0	7.5%	3.3

Myanmar (Burma)	81.3	17.2%	14.0	7.7%	1.1
New Zealand	209.3	11.2%	23.4	9.9%	2.3
Philippines	362.2	13.0%	47.1	7.4%	3.5
Singapore	340.0	8.5%	28.9	12.0%	3.5
South Korea	1,630.9	9.0%	146.7	11.5%	16.9
Sri Lanka	80.7	18.7%	15.1	7.1%	1.1
Taiwan	668.5	9.0%	60.4	11.3%	6.8
Thailand	501.9	15.0%	75.3	7.7%	5.8
Vietnam	340.8	20.0%	68.2	7.9%	5.4
Asia Pacific others	88.5	17.3%	15.3	7.7%	1.2
Asia Pacific total	30,301.6	12.9%	3,896.9	10.0%	389.9
Kazakhstan	164.8	15.1%	24.9	8.5%	2.1
Russia	1,473.6	16.1%	237.2	8.1%	19.2
Ukraine	151.5	15.9%	24.1	8.2%	2.0
CIS-others	262.9	16.3%	42.8	8.0%	3.4
CIS total	2,052.8	16.0%	329.1	8.1%	26.7

The same trend is observed in the Asia Pacific region where logistics costs as a percentage of GDP for other countries in the region that were not mentioned averaged at 17.3% while 3PL revenue as a percentage of logistics costs averaged at 7.7%. Also, some developing and emerging economies in this region had very high logistics costs such as Vietnam at 20%, Sri Lanka at 18.7%, Indonesia 22%, Myanmar 17.2%, LAO P.D.R 17.7% and Cambodia 16.4%.

These countries have low 3PL revenues at 7.9%, 7.1%, 7.7%, 7.5% and 8.0% respectively. However, there is an exception of New Zealand being one of the advanced economies and having a relatively high logistics costs of 11.2% (compared to other developed economies in the region with single digits such as Singapore at 8.5%, Japan at 8.5%, Australia at 8.6%, South Korea at 9.0%, Taiwan at 9.0, and Hong Kong at 8.5%). In the CIS region as well, all countries are developing and emerging economies with very high logistics costs and low 3PL revenues.

5.7.5 Middle East region logistics costs and 3PL revenue

Table 5.22: Middle East region, source: Armstrong & Associates (2022)

Country	GDP (2020) in US billions ($)	Logistics costs as a percentage of GDP	Logistics cost (2020) in US billions ($)	3PL revenue as a percentage of logistics cost	3PL revenue (2020) in US billions ($)
Iran	635.7	16.2%	103.0	8.1%	8.3
Israel	402.6	11.3%	45.5	9.9%	4.5
Pakistan	262.8	15.6%	41.0	8.3%	3.4
Saudi Arabia	701.5	13.0%	91.2	9.2%	8.4
Turkey	719.5	12.4%	89.2	9.5%	8.5
United Arab Emirates	354.3	10.0%	35.4	10.3%	3.6
Middle East others	625.1	15.0%	93.6	8.4%	7.8
Middle East total	3,701.6	13.5%	498.9	8.9%	44.6

In the Middle East the same trend is observed as all countries represented are classified as developing and emerging. However, Israel's logistics cost is slightly low compared to other economies in the region and developing/emerging economies in other regions. Also, Israel's 3PL revenue is not far lower than the logistics costs unlike most developing economies. Also, UAE seems to be an exception as it has slightly lower logistics costs than 3PL revenue unlike other developing/emerging economies in other regions and other countries in the region.

Therefore, the foregoing observations are summarized below:

- That developed and advanced economies are more efficient in logistics operations.
- Developed and advanced economies have higher 3PL revenues compared to developing and emerging economies which suggests higher levels of logistics outsourcing.
- That developing/emerging economies have less efficient logistics operations compared to developed economies.
- That developing/emerging economies have less 3PL revenues compared to developed/advanced economies suggesting lower levels of logistics outsourcing.
- That within developing regions some more developed economies have lesser logistics costs than others and higher 3PL revenue compared to others
- That within developed regions some less developed economies have lesser logistics efficiency and lesser 3PL revenue compared to others.
- That there are a few exceptions where a couple of developed economies such as New Zealand and Greece have similar logistics operations inefficiency and lower 3PL revenue with some developing/emerging economies.
- That there are also a couple of exceptions where developing/emerging economies such as Egypt and Macao SAR have similar logistics operations efficiencies and 3PL revenue as some of the developed/advanced economies.

The following assumptions therefore can be made pending further research and analysis:

- That economic development represented by high GNI is negatively correlated with lower logistics costs which indicates logistics operations cost efficiencies of companies in developed regions/countries.
- That lesser economic development represented by middle and low GNI is negatively correlated with higher logistics costs which indicates logistics operations cost inefficiencies of companies in developing regions/countries.
- That economic development represented by high GNI is positively correlated with higher 3PL revenues which indicates higher levels of logistics outsourcing in developed regions/countries.
- That lesser economic development represented by middle and low GNI is positively correlated with lower levels of logistics outsourcing.
- That less efficient logistics operations represented by higher logistics cost is negatively correlated with lesser logistics outsourcing represented by lower 3PL revenues.
- That efficient logistics operations represented by lower logistics cost is negatively correlated with higher logistics outsourcing represented by higher 3PL revenues.

5.7.6 Hypotheses statements

The first two assumptions will be tested using correlation analysis to test the association between economic development and logistics operations efficiencies of organizations in an economic territory. A hypothesis statement is made below therefore:

1. The alternative hypothesis H1, states that developed economies with high GNI per capita have lower logistics cost and less developed economies with low GNI capita have higher logistics cost. The null hypothesis H0 states that developed economies with high GNI per capita do not have lower logistics costs and less developed economies with low GNI per capita do not have higher logistics costs.

The third and fourth assumptions will be tested using correlation analysis to test the association between economic development and the level of logistics outsourcing. A hypothesis statement is therefore made below:

2. The alternate hypothesis H1, states that the level of logistics outsourcing in an economic territory has a positive linear relationship with the level of economic development. The null hypothesis H0 states that the level of logistics outsourcing in an economic territory has no positive linear correlation with the level of socio-economic development.

The fifth and sixth assumptions will be tested using correlation analysis to test the association between logistics operations efficiencies and level of logistics outsourcing. A hypothesis statement is therefore made below:

3. The alternate hypothesis H1 states that high levels of logistics operations cost in an economic territory is negatively associated with low levels of logistics outsourcing and vice versa. The null hypothesis H0 states that high levels of logistics operations cost in an economic territory is not associated with low levels of logistics outsourcing and vice versa.

The foregoing hypotheses will be tested using data from the tables above and the results will be compared with the literature review and content analysis in the discussion section of this chapter.

5.7.7 Defining variables

Economic development

This research will use the World bank, United Nations, and International Monetary Fund (IMF) as its major sources for defining socio-economic development and for grouping developed and developing countries. According to Roemer (2014), economic development should be seen as the extent to which an economy has put in place efficient and fair distribution of economic

resources. The omnipresent use of GDP per capita as a measure reflects a utilitarian concept based on justice, where individual utility of collective resources is defined as personal income, and the social welfare of a country is the average of utilities in a population. However, there is no clear definition or criteria from reliable sources such as the World bank, United Nations, or IMF with which to group developed and developing countries hence there is no group of countries termed developed and developing countries. The only identified group in World bank is Least developed countries (LDCs) which according to United Nations Department for Social and Economic Affairs (UN DESA) refers to low-income countries that are challenged with severe structural impediments to sustainable socio-economic development. The UN further describes them as highly susceptible to economic and environmental shocks with lower levels of human assets (UN DESA, 2021).

Therefore, for the purpose of this research, the World Bank income categories will be used to group developed and developing countries. The income categories are high income, low income, upper middle income, and lower middle-income countries (World Bank, 2023). The income groupings are based on Gross National Income (GNI) per capita. Gross national income (GNI) according to OECD is defined as “gross domestic product (GDP), plus net receipts from abroad of compensation of employees, property income and net taxes less subsidies on production. Compensation of employees’ receivable from abroad are those that are earned by residents who essentially live inside the economic territory but work abroad (this happens in border areas on a regular basis), or for people who live and work abroad for short periods (seasonal workers) and whose centre of economic interest remains in their home country. Property income receivable from/payable to abroad includes interest, dividends, and all (or part of) retained earnings of foreign enterprises owned fully (or in part) by resident enterprises (and vice versa)” (OECD, 2021, pg1).

Countries with high GNI per capita can borrow from the International Bank for Reconstruction and Development (IBRD). While countries with low GNI per capita and are unable to borrow from IBRD are classified into International Development Association (World Bank, 2023).

This research selects countries listed in the data above from Armstrong and Associates in the World Bank's list of high-income categories (see appendix) and classifies them as developed countries with a few exceptions which will be explained. Hence, GNI per capita of high-income countries will be used as variable representing developed countries in the correlation analysis. Based on the foregoing therefore, Upper middle income, lower middle income and low-income countries are all classified as developing countries or regions. Also, like the developed countries categories, countries listed in the data above from Armstrong and Associates will be selected from World Bank's list of income grouping excluding high income countries. The adopted World Bank income groupings are therefore used to define developed and developing countries on a relative or comparative basis for the purposes of this research. Nigeria is classified among lower middle-income countries however the GNI per capita of all income group countries excluding high income group countries will be used as proxy variable to represent developing countries in the correlation analysis. These income groupings from the World Bank will be used together as proxy variables to represent the level of economic development in hypothesis one and two above. The World bank income country groups are thus divided into the following income categories:

"For the current 2023 fiscal year, low-income economies are defined as those with a GNI per capita, calculated using the World Bank Atlas method, of $1,085 or less in 2021; lower middle-income economies are those with a GNI per capita between $1,086 and $4,255; upper middle-income economies are those with a GNI per capita between $4,256 and $13,205; high-income economies are those with a GNI per capita of $13,206 or more" (World Bank, 2023, pg. 1).

Further justifications for classifying high-income countries as developed and other World bank income groups as developing are provided in appendix 4A. The process of selecting developed and developing countries and the lists of selected countries' GNI and 3PL revenue for the correlation tests are also laid out in appendix 4B.

level of logistics outsourcing

There are no known measures or criteria to determine levels of logistics outsourcing in a country hence this research will use the 3PL revenues as a percentage of logistics cost of selected countries from the data above as an indicative measure of the level of logistics outsourcing in a country. This is because some countries like India have very high logistics revenues at $26 billion but this is actually low when compared to the country's overall logistics cost. India's 3PL revenue as a percentage of logistics cost is 7.4% which is a low percentage of its $351.8 billion in logistics cost. In contrast, UK has almost about the same GDP with India and less 3PL revenue at $22 billion but is deemed to have higher level of logistics outsourcing because its 3PL revenue as a percentage of logistics cost (with logistics cost being $230.3 billion) is 9.8%. Hence the UK has more efficient logistics operations because of lower logistics costs and higher level of logistics outsourcing because of a higher percentage of its logistics costs going to 3PL companies as revenues. Therefore, data on 3PL revenues as a percentage of logistics cost obtained from Armstrong and Associates (2022) will be used as a variable in hypotheses two to represent the level of logistics outsourcing in an economic territory.

Cost efficiency of logistics operations

This research will use logistics cost as a percentage of GDP as an aggregate indicative measure of the efficiency of logistics operations by companies in selected countries. The percentage of logistics in the GDP is used as a measure of aggregate cost efficiency of logistics operations by companies in a country because it shows how much of the gross domestic product is accounted for as logistics costs, the lesser the logistics costs the more efficient.

Logistics costs as a percentage of GDP therefore will be used as a variable to represent cost efficiency of logistics operations in the correlation analysis.

Tables 5.23 to 5.25 below compare high and lower-middle income countries in terms of social, economic, and other indicators respectively.

Comparing high income and lower-middle income countries

Table 5.23: comparing social indicators between high and lower middle-income countries.

Social indicators	High-income countries	Lower-middle income countries	Comments
Poverty head count ratio (2019)	0.6%	10.2%	Higher percentage of poverty head count ratio (percentage of the population living on less than $2.15 a day in 2017 purchasing power adjusted prices) in lower-middle income countries indicates higher income inequality and lesser maturity of industry/markets to provide sufficient resources and income. This means that though economic growth does not automatically result in reducing poverty head count ratio however, the foregoing information indicates opportunities for growth which includes increase in business

			activities requiring increased logistics operations.
Total life expectancy at birth (2019)	80 years	69 years	Shorter life expectancy at birth in middle-income countries indicates conditions of living that with more hazards and risks which can affect the business operations and can possibly cause supply chain disruptions requiring increased logistics operations.
Population growth (2021)	0.00%	1.2%	Populations growth in lower-middle income countries indicates opportunities for growth in economy resulting in increased business activities requiring increased logistics operations.
Total population (2021)	1.24 billion	3.4	Higher population of lower-middle income, again countries indicate opportunities for economic growth and increased business activities requiring increased logistics operations.
Net migration (2021)	2,128,855	-1,444,849	High net migration in the high-income countries and a negative net migration in lower-middle income countries indicates better living conditions in high income countries and a more sufficient and equitable distribution of income.

Table 5.24: comparing economic indicators between high and lower middle-income countries.

Economic indicators	High-income countries	Lower-middle income countries	Comments
GDP per capita	$48,225.2	$2,572.7	The significant difference in average GDP per capita between the two income groups shows a significant opportunity for economic growth as the population of lower-middle income countries is almost three times more than high-income countries. This will increase business and logistics activities in lower-middle income countries than higher income countries.
Average annual GDP growth (2021)	5.2%	5.6%	Higher GDP growth in lower-middle income countries shows that these economies and their various sectors/markets are relatively maturing or still in their development stages.
Unemployment rate (2021)	5.6%	6.5%	Higher unemployment rates in lower-middle income countries indicates lower investments and opportunities for growth in business and commerce
Average inflation,	2.5%	4.7%	Higher inflation in lower-middle income countries indicates higher costs of operating businesses in lower-middle income countries

consumer prices (2021)			
Total GDP (2021)	$59.83 trillion	$8.74 trillion	Total GDP of higher income countries is seven times more than lower-middle income countries
Personal remittances	0.3% of GDP	4.5% of GDP	Personal remittances of lower-middle income countries are fifteen times higher than high income countries because of the negative migration figures in these countries requiring remittances from these migrants.

Table 5.25: comparing other indicators between high and lower-middle income countries.

Other indicators	High-income countries	Lower-middle income countries	Comments
Access to electricity (% of population) 2020	100%	90.1%	Higher access to electricity in high income countries indicates a more conducive business environment which reduces costs of operation and increases efficiency
Annual freshwater withdrawals (% of internal resources) 2019	9%	18%	Higher annual freshwater withdrawals in lower-middle income countries indicates more mineral resources and a strong primary economy unlike the high-income countries

			which rather have strong secondary and tertiary economies
People using safely managed sanitation services (% of population) 2020	87%	46%	Lower percentage of people using safely managed sanitation services in lower-middle income countries indicates better conditions of living enabled by a strong and matured secondary and tertiary economy which is still in its developing stages in middle income countries. Provisions of logistical services fall into these categories of economic activities as it is part of the service sector hence may affect the level of logistics outsourcing
People using internet (% of population) 2020	89%	45%	People using internet is two times higher in high income countries than lower-middle income countries which indicates a relatively more enabling business environment, and it also indicates greater use of IT services which is crucial in the provision of logistical services
Foreign direct investment 2021	2.3%	1.7%	High income countries have higher FDI because the ease of doing business is more with less risks of doing business
Central government	131.5%	No available data	High income countries have very high central government debts because of high

debt (% of GDP) 2021			government expenditure on providing an enabling business environment

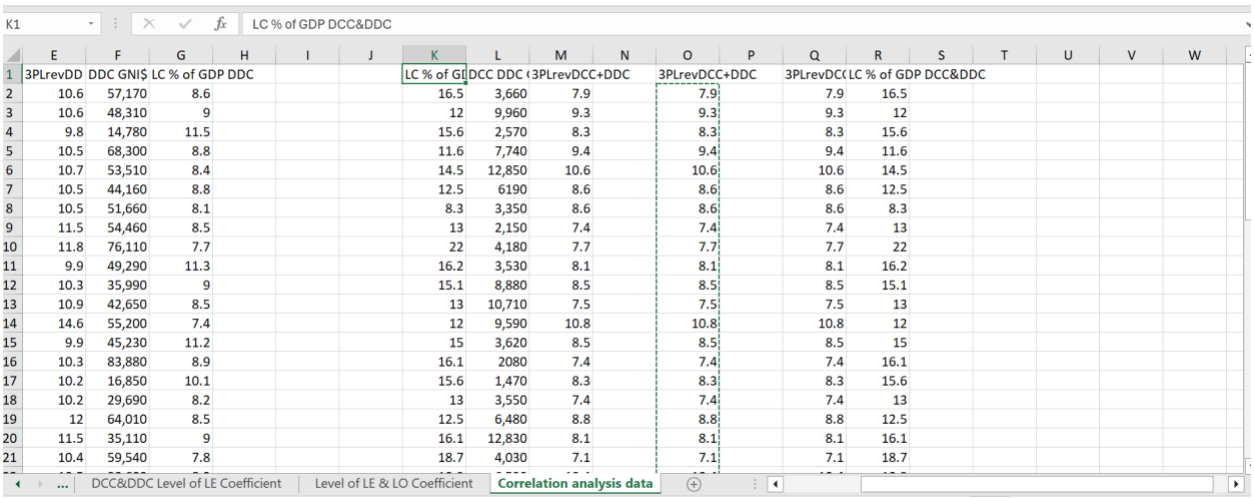
Having defined developed and developing country contexts this study will now use correlation statistical analysis to test the hypotheses.

5.7.8 Results of correlation analysis

The lists of selected developed and developing countries along with their GNIs and 3PL revenues for this correlation analysis is laid out in appendix 4B.In the results below, LC refers to logistics costs and DCC refers to developing country contexts. Also, DDC refers to developed countries.

Figure 5.18 below is a screenshot of the data as inputted into excel. Columns E includes the 3PL revenue as a percentage of logistics costs of developed countries and column F includes the GNIs of developed countries while column F includes the logistics costs of developed countries. Figure 5.21 shows results that was obtained by copying columns F and G and running a correlation coefficient test. Figure 5.19 shows results that were obtained by copying columns K (logistics costs as percentage of GDP of developing countries) and column L (GNIs of developing countries) and running a correlation test and so were all the other tests done.

Figure 5.18: screenshot of how correlation analysis was performed



	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	3PLrevDD	DDC GNI$	LC % of GDP DDC				LC % of GDP DCC DDC		3PLrevDCC+DDC		3PLrevDCC+DDC		3PLrevDCC+DDC	LC % of GDP DCC&DDC					
2	10.6	57,170	8.6				16.5	3,660	7.9		7.9		7.9	16.5					
3	10.6	48,310	9				12	9,960	9.3		9.3		9.3	12					
4	9.8	14,780	11.5				15.6	2,570	8.3		8.3		8.3	15.6					
5	10.5	68,300	8.8				11.6	7,740	9.4		9.4		9.4	11.6					
6	10.7	53,510	8.4				14.5	12,850	10.6		10.6		10.6	14.5					
7	10.5	44,160	8.8				12.5	6190	8.6		8.6		8.6	12.5					
8	10.5	51,660	8.1				8.3	3,350	8.6		8.6		8.6	8.3					
9	11.5	54,460	8.5				13	2,150	7.4		7.4		7.4	13					
10	11.8	76,110	7.7				22	4,180	7.7		7.7		7.7	22					
11	9.9	49,290	11.3				16.2	3,530	8.1		8.1		8.1	16.2					
12	10.3	35,990	9				15.1	8,880	8.5		8.5		8.5	15.1					
13	10.9	42,650	8.5				13	10,710	7.5		7.5		7.5	13					
14	14.6	55,200	7.4				12	9,590	10.8		10.8		10.8	12					
15	9.9	45,230	11.2				15	3,620	8.5		8.5		8.5	15					
16	10.3	83,880	8.9				16.1	2080	7.4		7.4		7.4	16.1					
17	10.2	16,850	10.1				15.6	1,470	8.3		8.3		8.3	15.6					
18	10.2	29,690	8.2				13	3,550	7.4		7.4		7.4	13					
19	12	64,010	8.5				12.5	6,480	8.8		8.8		8.8	12.5					
20	11.5	35,110	9				16.1	12,830	8.1		8.1		8.1	16.1					
21	10.4	59,540	7.8				18.7	4,030	7.1		7.1		7.1	18.7					

The correlation tests were done in the following manner: the analysis of the correlation between level of economic development and the level of cost efficiency of logistics operations was first tested using the GNI per capita of developing countries and their logistics cost as a percentage of GDP and then a second test using the GNI per capita of developed countries and their logistics cost as a percentage of GDP was done. A further third test was done adding data from both groups together. The correlation coefficient in the first test is shown in Table 5.25 below:

Table 5.26: Correlation test result between GNIs of developing countries and logistics costs.

	DCC GNI $	*LC % of GDP DCC*
DCC GNI $	1	
LC % of GDP DCC	-0.28661	1

The correlation coefficient indicates a low negative correlation between the GNIs of developing countries and the cost of logistics operations in developing countries.

Figure 5.19 shows how the process was performed:

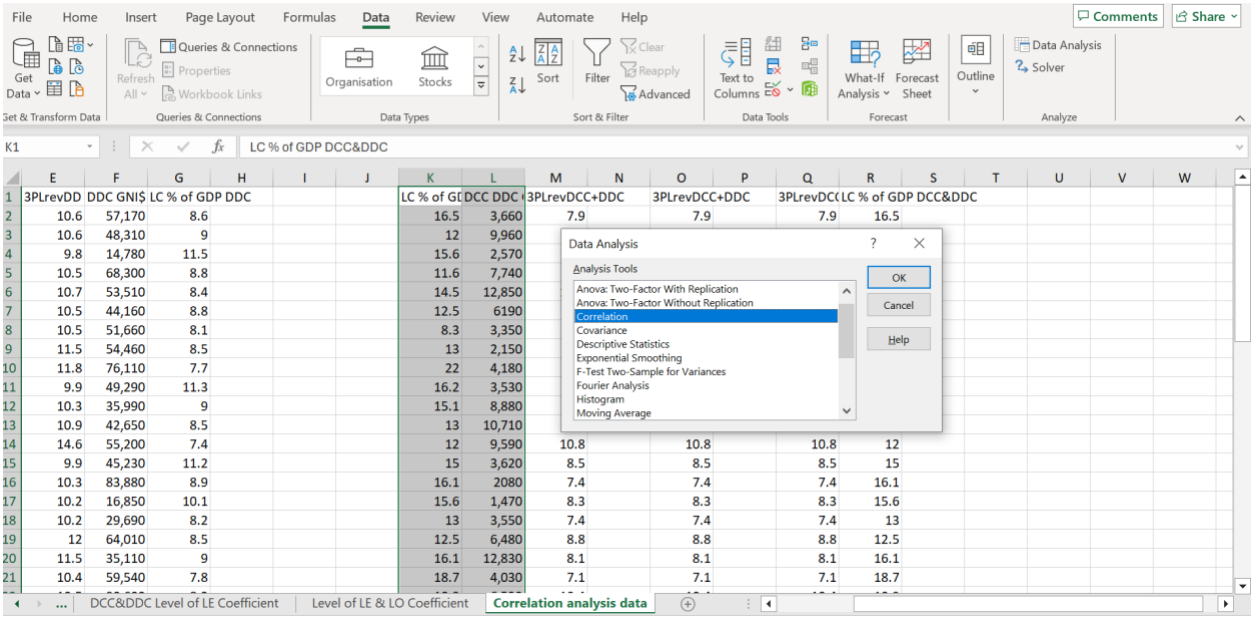
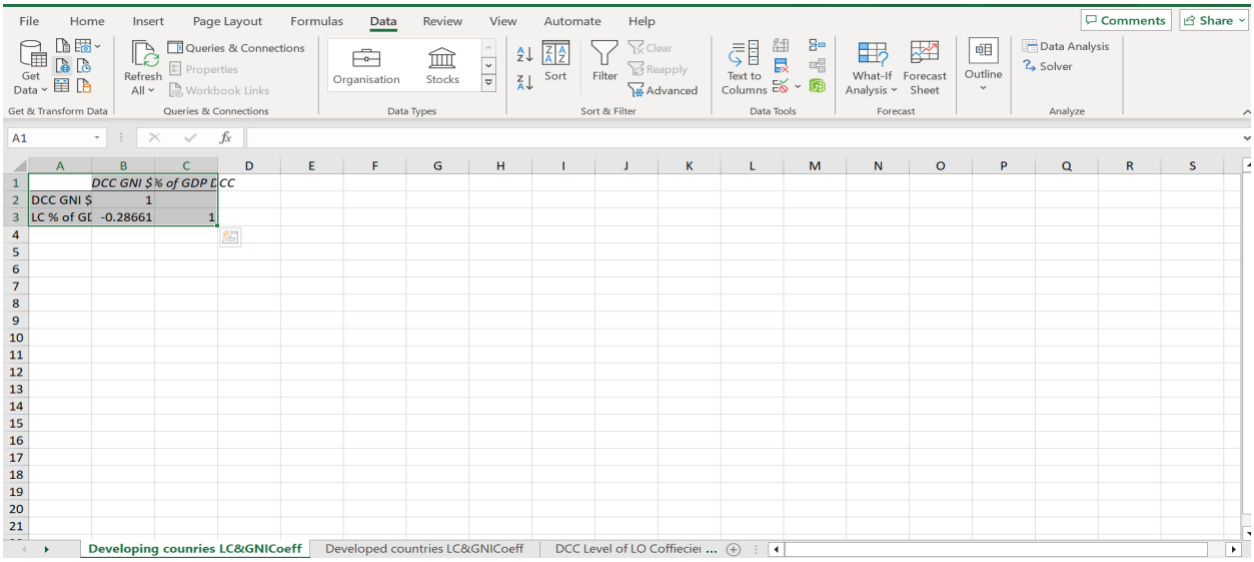


Figure 5.19 above shows that the result above in table 5.24 was obtained by copying column K1-K26 (logistics cost as a percentage of GDP of developing countries) and column L1-L26 (GNI per capita of developing countries) and selecting the Data tab from the top bar menu and afterwards selecting Data Analysis from the top right-hand corner and then selecting correlation in the open dialogue and clicking OK as seen from the screenshot- figure 5.19 above. The correlation coefficient result appeared in a new sheet as can be seen in the screenshot below.

figure 5.20 below shows the result:



In the second test DDC refers to developed countries. The result of the second test is shown in Table 5.26 below:

Table 5.27: Correlation test result between GNIs of developed countries and logistics cost

	DDC GNI$	*LC % of GDP DDC*
DDC GNI$	1	
LC % of GDP DDC	-0.50443	1

The correlation coefficient indicates a medium negative correlation between the GNIs of developed countries and cost of logistics operations in developed countries.

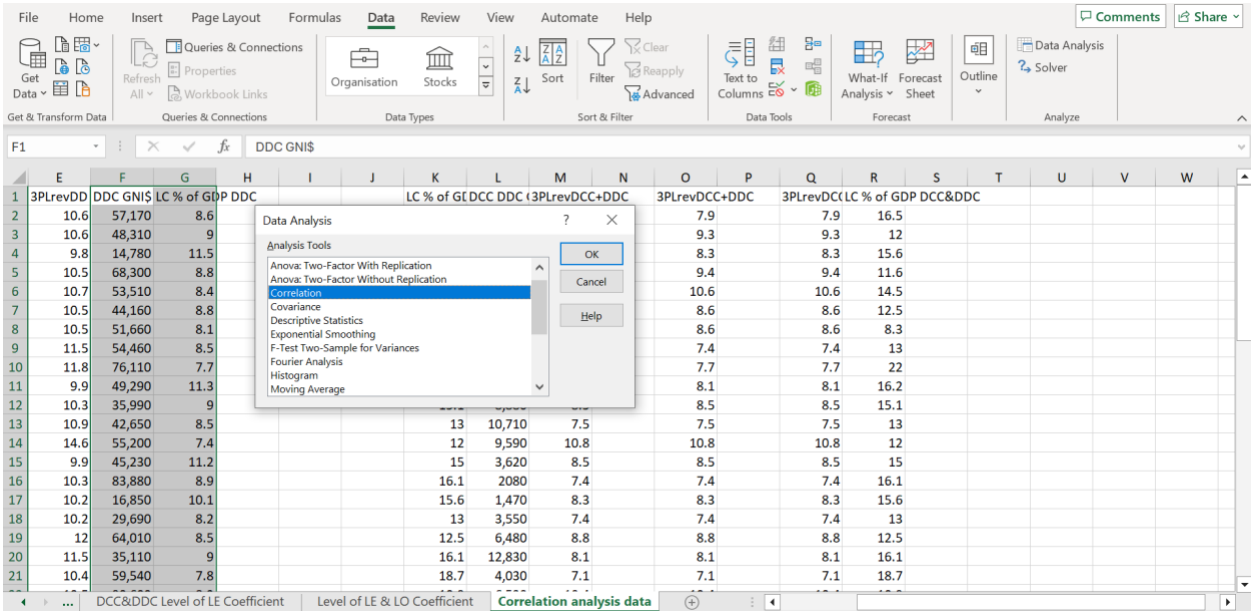
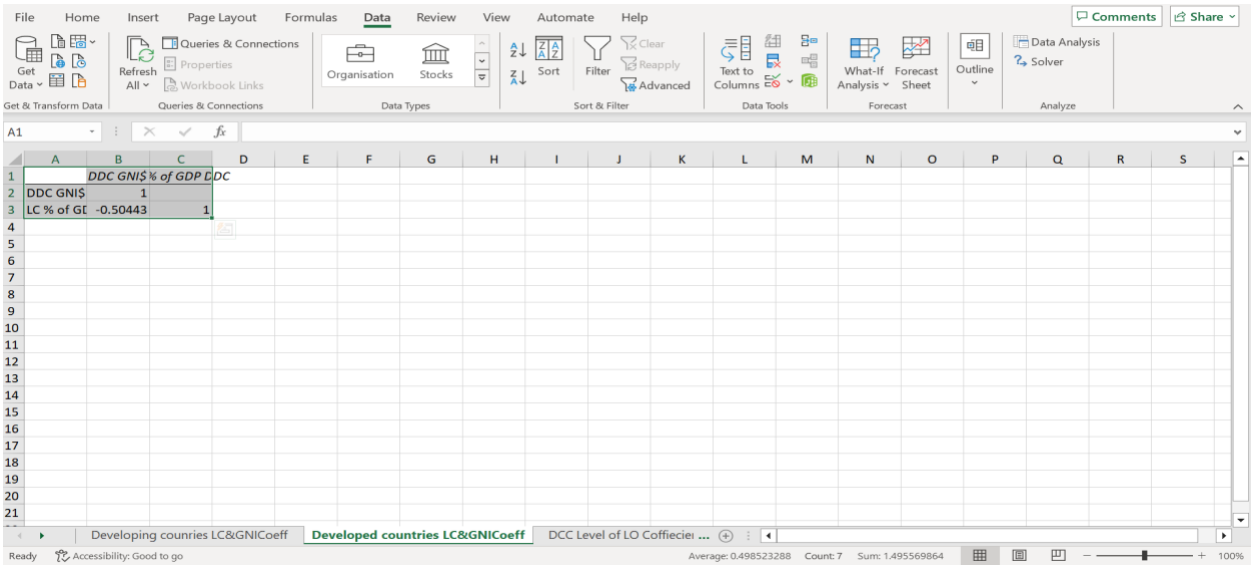


Figure 5.21 above shows that the result above was obtained by copying columns F (GNI per capita of developed countries) and column G (cost of logistics as a percentage of GDP) and selecting the Data tab from the top bar menu and afterwards selecting Data Analysis from the top right-hand corner and then selecting correlation in the open dialogue and clicking OK as seen from the screenshot- figure 5.21 above. The correlation coefficient result appeared in a new sheet as can be seen in the screenshot- figure 5.22 below.



However, when both data from developed and developing countries are combined and performed in a third test, the correlation coefficient is different as shown in Table 5.27 below:

Table 5.28: Correlation test result between level of economic development and level of logistics operations efficiency

	LC % of GDP DCC&DDC	*DCC DDC GNI $*
LC % of GDP DCC&DDC	1	
DCC DDC GNI $	-0.75533	1

The correlation coefficient indicates a high negative correlation between the GNIs of countries and their logistics costs. Hence, the null hypothesis is therefore rejected. This means that to a high extent, the higher the economic development of a country the lower the cost of their

logistics operations and the lower the economic development of a country the higher the cost of their logistics operations. This further means that higher economic development is often associated or characterized with cost efficiency of logistics operations because logistics cost is low and lower economic development is often associated or characterized with cost inefficiency of logistics operations because logistics cost is high.

The second hypothesis tests whether there is a relationship between the level of economic development and the level of logistics outsourcing. Again, the GNI of developing countries and their 3PL revenues as a percentage of logistics cost was first used to test if a relationship exists and the correlation coefficient is shown in Table 5.28 below:

Table 5.29: Correlation test result between GNIs of developing countries and 3PL revenues

	3PLrevDC	*DCC GNI $*
3PLrevDC	1	
DCC GNI $	0.536217	1

In the correlation result table above, the 3PLrev refers to 3PL revenue. The correlation coefficient indicates a medium positive correlation between the GNIs of developing countries and third-party logistics revenues as a percentage of logistics in developing countries. The result of the second test is shown below.

Table 5.30 below:

	3PLrevDD	*DDC GNI$*
3PLrevDD	1	

DDC		
GNI$	0.305228	1

The correlation coefficient indicates a low positive correlation between the GNI of developed countries and the third-party logistics revenue as a percentage of logistics cost in developed countries.

When the correlation analysis was performed together using combined data from both groups the result is shown in Table 5.30 below:

Table 5.31: Correlation test result between level of economic development and level of logistics outsourcing

	DCC DDC GNI $	*3PLrevDCC+DDC*
DCC DDC GNI $	1	
3PLrevDCC+DDC	0.751815	1

The correlation coefficient indicates a highly positive correlation between the level of economic development and level of logistics outsourcing. The null hypothesis is therefore rejected. This means that the level of economic development in an economic territory is often associated with the level of logistics outsourcing. This further means that developed countries or economic territories are often associated with higher levels of logistics outsourcing and developing countries or economic territories are often associated with lower levels of logistics outsourcing.

A further correlation analysis is performed to test if a relationship exists between the level of logistics efficiency and level of logistics outsourcing. Hence, the logistics costs as a percentage

of GDP of all countries selected will be used as a variable to represent the logistics efficiency and the third-party logistics revenue as a percentage of logistics costs will be used as a variable to represent the level of logistics outsourcing. This further test along with the previous tests will be used as the basis for developing a tentative theory which will be explained subsequently. The result of the test is shown in Table 5.31 below:

Table 5.32: Correlation test result between level of logistics efficiency and level of logistics outsourcing

	3PLrevDCC&DDC	LC % of GDP DCC&DDC
3PLrevDCC&DDC	1	
LC % of GDP DCC&DDC	-0.78194	1

The correlation above indicates a high negative correlation between the level of logistics efficiency and level of logistics outsourcing. This is because the lower the logistics costs the higher the 3PL revenue and the higher the logistics costs the lower the 3PL revenue. This suggests that in developing countries where logistics costs are higher indicating lower cost efficiency, companies tend to keep logistics in-house and outsource less compared to developed countries. It also suggests that in more developed countries where logistics costs are lower indicating high efficiency, companies tend to outsource logistics more compared to developing countries. Hence a tentative theory is built based on this data and the correlation result. As earlier stated, the theory suggests that companies tend to keep more logistics activities in-house partly because of the infrastructural limitations and other socio-economic challenges that affect supply chain and business performance. The theory therefore postulates

that in developing countries where logistics operations are generally less cost efficient, organizations tend to be more conservative towards outsourcing logistics activities. Hence, organizations tend to keep the risks in-house so that they can control them. Furthermore, the theory postulates that logistics operations cost inefficiencies associated with developing countries are one of the reasons for lower use of the services of 3PL companies as clients in developing countries do not trust 3PL companies to help make any significant difference in cost savings or improved supply chain performance if they outsource certain logistics activities to 3PL companies in developing countries because of the inherent infrastructural and other socio-economic related limitations and challenges within the supply chains of developing countries. Hence companies tend to keep such logistics activities as inventory management in-house to control the risks and outsource activities such as transportation related where they have less control of the risks. This theory will be further explained in the discussion section of this chapter.

5.8 THEMATIC ANALYSIS OF SEMI-STRUCTURED INTERVIEWS

5.8.1 Notes from phone call (WhatsApp) semi-structured interview with the pharmaceutical company post quantitative data collection

The tables below show notes made by the researcher during phone call semi-structured interviews with the interviewees. The questions focused on understanding why certain logistics activities are not outsourced by the participant's organisation. A further question is asked to understand what factors that can make outsourcing more attractive both generally and in respect to the particular logistics activity not being outsourced. The list of questions can be found in appendix 2C. Only 3 out of the 6 respondents were available and participated in the semi-structured interviews. Then themes are drawn from the answers provided using NVivo10 software. The themes are topic areas applicable to the research that are drawn from the answer of the respondents. The themes are used in the discussion section below to draw conclusions.

Table 5.33: thematic representation of semi-structured interview response from the pharmaceutical company

No.	Logistics activity	Reasons for zero activity	Factors that will make outsourcing more attractive	Theme
1.	IT (e.g., tracking)	This activity will need to be closely monitored and under the direct control of the organization	Outsourcing can be more attractive if it is not part of the core business of the business. We are in business to produce and sell pharmaceutical products so anything not directly related to achieving these objectives can be outsourced	Control, Business strategy
2.	Customer service	Same as above	Same as above	Control, Business strategy
3.	Inventory management	Same as above	Same as above	Control, Business strategy
4.	Order processing	Same as above	Same as above	Control, Business strategy
5.	Packaging	Same as above	Same as above	Control, Business strategy
6.	Material handling	Same as above	Same as above	Control, Business strategy

Researcher: these activities above are not a core part of your business how come they are still not outsourced?

Respondent: these activities are important and directly affect the success of our core business hence we monitor them closely to ensure we keep control of these activities to mitigate risks.

Theme: risk management and control- **sub-theme**: risk-averse

5.8.2 Key points from phone call (WhatsApp) semi-structured interview with Agriculture1 post quantitative data collection

Table 5.34 thematic representation of response from agriculture1

No.	Logistics activities not outsourced	Reasons for zero outsourcing	Factors that will make outsourcing more attractive	Theme
1.	Inbound logistics	This is a core part of our business as we provide and supply raw Agric-products and materials that are used by manufacturers and farmers	This is part of our specialty, so we won't outsource it. Outsourcing this activity cannot be attractive for us as it takes away part of our unique selling point.	Business strategy
2.	Inventory management	We chose to gain control of this activity as we do not need the special skills of	We will only outsource our inventory management if we	Cost

		external experts. The benefits of using external experts does not outweigh the cost as this is part of our core capabilities	grow too big and are unable to manage our inventory alone	
3.	Order processing	The seasonal nature of our business makes it easy to predict and plan for demand hence order processing and management is easy for us	Same as above	Competence
4.	Material handling	The nature of our products makes it necessary that we handle them ourselves for infection control and safety purposes	Same as above	Control
5.	Packaging	We do not need experts to do this	Same as above	Competence

5.8.3 Key points from phone call (WhatsApp) semi-structured interview with Agriculture2 post quantitative data collection

Table 5.35 thematic representation of response from agriculture2

No.	Logistics activities not outsourced	Reasons for zero outsourcing	Factors that will make outsourcing more attractive	Themes
1.	Inventory management	We can better control it ourselves and we do not require external experts to do it for us	The business is seasonal, so logistics is needed more often during the busy periods	Control
2.	Order processing	The same reason as above because of the seasonal nature of our business we can plan and prepare for it	Same as above	Competence
3.	Material handling	The same as the reason for inventory management	Same as above	Control

5.9 Discussion of primary quantitative data analysis findings with findings from literature review and content analysis

Summary of findings from literature review parts two and three which are more relevant in answering the research questions and achieving the research aim and objectives are outlined in a table in appendix 1. See appendix 1.

Levels of logistics outsourcing

The primary data gathered from the large pharmaceutical corporation shows that transportation and distribution of goods are fully outsourced, inbound logistics are partially outsourced, outbound logistics are highly and warehousing are partially outsourced. On the other hand, IT tracking, order processing, inventory management, customer service, packaging and material handling are all not outsourced. These activities are more secondary logistics activities. The Fast-Moving Consumers Goods (FMCG) company had a different view as they indicated that all logistics activities are fully outsourced except inventory management, order processing, packaging and IT which were all ranked by the FMCG as highly outsourced (75% outsourced). The Agricultural companies had similar views with the pharmaceutical company as they noted that Transport related activities are the most outsourced especially outbound delivery to final customers. They also noted like the pharmaceutical company that warehouse management is outsourced but highly (that is 51-75%). While IT (tracking) and customer service are partially outsourced, inventory management, order management, material handling and packaging are done inhouse. The manufacturing company had similar view except that warehouse management is lowly outsourced, transportation and distribution management partially outsourced while order management, inventory management and customer service are not outsourced. Packaging and material handling are however lowly and partially outsourced respectively. On the global level, “According to a survey performed by Forrester Research, 78%

of Fortune 500 companies have outsourced transportation services, 54% of them have outsourced their distribution services" (Uzodinma, n.d., pg12). Furthermore, basic logistics functions such as Distribution and Transportation management has the highest share of outsourced logistics activity according to Report Linker (2020). The Distribution and Transport Management (DTM) segment of third-party logistics is expected to reach a global market value of $577 billion by 2025 (Report Linker, 2020). The foregoing evidence from Report Linker is an external validity of the findings of this research from the primary data collected. However, why does organisation globally and particularly in Nigeria and similar developing countries outsource transport related activities more than other activities?

Focusing on Nigeria and similar developing countries, the literature review shows that one of the motivating factors for outsourcing logistics is risk sharing (Kariko 2012; Macharia et al., 2016; Onyebueke et al., 2019; Adebambo et al., 2015). The interviews from the agriculture research participants show that they tend to keep activities that they can control in-house so as to mitigate risk compared to activities where they might need the expertise of a 3PL to accomplish. Hence, they tend to share the potential risks of activities such as transportation related activities with third party logistics companies as these activities are more prone or exposed to risks such as congested roads networks and ports, high rate of traffic accidents, security issues such as smuggling and robbery which are all outside the control of the organisation. These risks are more prevalent in developing countries such as Nigeria as evidenced in the content analysis in which risk management related themes are represented 9 times in the data. Sub-themes such as infrastructure risk, security risk and accidental risk are all identified in the content analysis as challenges affecting the entire Nigerian logistics industry and supply chains and not necessarily impeding logistics outsourcing. Hence, organisations find the need to use the expertise of 3PLs to deal with these activities and to share the risks associated which are less controllable by organisations. On the other hand, activities such as inventory management and order

processing though may also be affected by supply chain disruptions as these might affect how much goods can be stored in retail stores and may affect order fulfilment respectively. However, organisations in Nigeria and developing countries can better control these activities than they can control transportation related activities because of the nature of these activities. The foregoing is evidenced in Macharia et al. (2016) study which shows a strong positive correlation between 3PL and transportation in the Oil and Gas sector in Kenya (a similar developing country with Nigeria) but a weak positive correlation between 3PL and inventory management indicating higher outsourcing of transportation activities. Therefore, based on the literature review, the content analysis, quantitative analysis of the primary data and the notes from the semi-structured interview, this research argues that risk sharing is a major reason for higher outsourcing of transportation related activities compared to activities such as inventory management, order processing, packaging, material handling and customer service. This is because the risks associated with transport related activities are less controllable hence the need for organisations to share these risks with 3PL companies.

On the other hand, in developed countries, Arroyo et al. (2006) indicated that more tactical and/or strategic and integrated logistics functions are outsourced in the USA and Europe while more core or primary logistical functions are outsourced in Mexico (similar developing country with Nigeria). Developed economies have more complex and integrated third party logistics practice where third party logistics companies provide integrated and value added service therefore going beyond the provision of basic logistics activities such as distribution and transport management, last mile delivery, warehousing, to more advanced services such inventory management, order management and processing, supply chain simulation and modelling, handling and packaging, customer service, demand management and engineering services such as warehouse build and/or design; high technology equipment installation and specialist equipment. The foregoing is evidenced in a case study of Wincanton logistics in the

United Kingdom (Financial Times, 2020). Furthermore, because the aforementioned risks prevalent in developing countries are not prevalent in developed countries, organisations are willing to outsource their logistics activities at an integrated level where all logistics activities are outsourced to one 3PL company such that cost per activity is reduced and performance is optimized. This shows that there is a functional market for integrated logistics outsourcing services in developed countries. This further indicates that the market is more matured. In contrast, Armstrong, and Associates (2020), Statista (2020) and Modor Intelligence all acknowledged that the third-party logistics market in Nigeria is still at its maturing or developing stage. Also, Gorane and Kant (2016) argued that logistics outsourcing is moderately penetrated, practiced or used among Indian manufacturing firms (a similar developing country with Nigeria). Etokudoh et al. (2017) also noted that Oil and Gas companies in Nigeria practice logistics outsourcing partially, bit by bit and unsystematically. Etokudoh et al. (2017) also reported that underdeveloped third-party logistics market is one of the limitations to logistics outsourcing in the Oil and Gas industry in Nigeria.

Logistics outsourcing and business performance

Also, primary data shows that the large pharmaceutical company believes that outsourcing Distribution and Transportation management (DTM) and other transportation related activities has extremely high impact on business performance while warehousing has high impact on business performance. The FMCG company also had similar view of the impact of outsourcing on logistics activities with all activities been extremely high except inbound logistics and transportation and distribution both of which are perceived as high. This suggest that the socio-economic and infrastructural limitations to supply chains in Nigeria may have reduced the positive impact of outsourcing on the company's supply chain performance of the organisation as perceived by the FMCG participant. FMCG unlike the pharmaceutical company outsource all of its logistics activities hence there is possibility that that non transport related activities bearing

risk that are more controllable may have yielded more results than transport related activities. However, just like the pharmaceutical company, transport activities are outsourced to share associated risks with 3PLs. These transport related risks are less controllable. Also, the FMCG company being a multinational corporation operating in all 36 states in Nigeria, the massive nature of the business operations may require more expertise from 3PL to manage their inventory and order processing. On the part of the Agriculture1 and manufacturing, logistics also have high positive impact on business performance while the Agriculture2 is more conservative on the impact of logistics outsourcing on the firm's business performance. The literature on logistics outsourcing on firm performance in Nigeria and similar developing countries suggests that outsourcing has a reasonable level of positive impact on business performance. Kariko (2012) noted that logistics outsourcing improved the supply chains of studied universities in Kenya. Curea (2016) noted that the use of 3PLs gives companies advantage in their inbound and outbound logistics (distribution) because products reach the market on time and are delivered on time. All the foregoing is empirical evidence from the literature review that proves that logistics outsourcing can have positive impact on the supply chain and business performance of organizations in a developing country context. Onyebueke et al. (2019) noted that 85.6% of its respondents in the Nigerian oil and gas sector agree that outsourcing has improved service delivery and 80% agreed that outsourcing has reduced overall operational cost and Etokudoh et al. (2017) also noted that 76% of its respondents agree that outsourcing has come with its benefits. However, Horsefall et al. (2018) noted that Service dependability and effectiveness has a higher average mean score for organizations who kept their logistics in-house compared to those who outsource. Nevertheless, a study in the developed country context by Solakivi et al. (2011) on logistics outsourcing and firm performance in Finland gathering data from 223 manufacturing and trading company concluded that no gain or loss was made from logistics outsourcing. The result of the foregoing study, however, is one of a few exceptions to many studies in the developed country context that suggest logistics outsourcing

has contributed to gains and profit making (Leuschner et al, 2014; Jayaram and Tan, 2010; Yeung et al., 2012).

From the semi-structured interviews, the research participants from the agriculture sector suggests that some logistics activities such as inventory management is more cost effective to keep in-house as risks can be controlled better in-house. Hence, the services of experts are not required. This suggests that the perceived benefits of logistics activities managed by the expertise of 3PL firms are among the major motivating factors for outsourcing logistics activities. However, the nature of the business of the organisation and size of the logistics activity within the organisation may also affect the decision whether to outsource such logistics activity or not. For example, the FMCG is a much bigger organisation compared to the Agriculture1, while the FMCG outsource inventory management and all other logistics activity, the agriculture1 responded that inventory management may be considered for outsourcing if the organisation's logistics operations in Nigeria grow too big that they require the expertise of a third-party logistics company to manage some or all of its inventory management.

Also, the foregoing further suggests that the level of competence or the capability of an organisation in managing or keeping a logistics activity inhouse plays a role on the decision to outsource. If the organisation is competent in the logistics activity and/or if it is a part of or the whole of the organisation's core business activity it will be much more efficient and effective to keep such logistics activity in-house as suggested from the semi-structured interview with Agriculture1 and the pharmaceutical company. The participant from agricultural1 noted that the reason they do not outsource inbound logistics is because it is part of their core capabilities as they are suppliers of Agric-products to manufacturers while the participant from the pharmaceutical company noted that activities that are not directly related to achieving the objectives of the organisation's core business activities are outsourced.

Furthermore, Kainzi (2016) argued that compromising an organization's core business by outsourcing or giving up some of the organization's core business activities as a result of outsourcing can be considered as an opportunity cost of outsourcing. This is one of the indirect costs of outsourcing and this along with other indirect costs of outsourcing may have longer term impact on the organisation's goals and objectives (Wang et al., 2017; Zailani et al., 2015). These indirect costs of outsourcing are part of the Transaction cost economics of outsourcing. The indirect costs include those internal competencies of the organisation such as financial and non-financial investments made into logistics activities, assets such as warehouse, trucks, delivery vans, technology equipment. Also, indirect costs may include trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs (Kalinzi, 2015; Beimborn, 2006; Dahlman, 1979).

Logistics outsourcing and cost efficiency

Most scholars have focused on the direct cost of outsourcing such as service fee/contract costs when deciding if it is cost effective to outsource or to keep a logistics activity in-house however as discussed above, indirect and opportunity cost are among the cost of outsourcing and though some of the indirect cost such as cost of adaptation or relationship cost and opportunity cost may be difficult to quantify in some cases, they provide a full picture of the costs associated with outsourcing when they are included in the considerations made when deciding on whether to outsource or not. This is an area of the TCE theory that this research has shed light on by incorporating these costs in the third-party logistics decision support framework. Hence, when calculating the extent to which logistics outsourcing can bring value to an organisation through cost efficiency, organisations can also incorporate indirect and/or opportunity cost where applicable in order to arrive at the true cost efficiency of outsourcing (Michael & Michael, 2011; Williamson, 1998; Williamson, 2008). Also, as there are indirect costs associated with

outsourcing, there are also indirect cost savings that come with outsourcing (Andersen et al., 2010). According to Andersen et al. (2010), these indirect costs are realised in other support functions such as for example HR, IT, when a particular function/department is outsourced such as transportation and warehousing. There are also opportunity cost savings in terms of profit that would have been made if an organisation had outsourced a function that are not in their core competence (Andersen et al. 2010). Literature proves that cost savings or cost efficiency is the topmost aim of outsourcing (Quelin & Motlow 1998; Wang and Regan 2002; Adebambo et al. 2015; Buyukozkan et al. 2007; Konig and Spinler 2016; Nunez-Carballosa and Guitart-Tarres 2011; Jain et al. 2022; Curea 2016; Cichosz et al. 2017; Etokudoh et al. 2017; Bask, 2001).

The foregoing is evident in the response of the participants of this research to logistics outsourcing and cost efficiency. The pharmaceutical company, FMCG and Agriculture1 all had very positive response towards cost efficiency in logistics outsourcing while the manufacturing company and agriculture2 both were also positive about cost efficiency in outsourcing but a bit more conservative. All logistics activities had varying responses from the participants, but majority are positive towards logistics outsourcing and cost efficiency. However, most organisations do not factor in both the indirect costs associated with outsourcing and the indirect cost savings derived from outsourcing (Williamson, 2008; Andersen et al., 2010).

Also, there are soft factors that are too complex to quantify in terms of monetary terms that may cost an organisation indirectly when outsourcing. An example of such soft factor is employees' reluctance to work with 3PL staff and problems related to staff changes as reported in the content analysis according to Etodukoh et al. (2017) as one of the challenges associated with logistics outsourcing in the Oil and Gas industry in Nigeria. The foregoing problem may affect the average productivity level of staffs in an organisation which ultimately affects cost and time efficiency in the long run. If organisations take an action to resolve such problems most times, it also results in financial costs.

Use of modern technologies (by 3PLs) and its effect on operational efficiency and customer satisfaction

The primary data shows that all the respondents except agriculture2 either agreed or strongly agreed that the use of modern technologies by 3PL companies can improve operational efficiency and customer satisfaction. The respondent from the agricultural company agreed that modern technology can positively affect customer service satisfaction and retention but disagreed that it can contribute to cost saving. However, the response from other participants suggests that modern technology plays vital roles in overall customer satisfaction and on cost savings. Jain et al. (2022) noted that lack of cutting-edge technologies is among the barriers to the Indian healthcare supply chains suggesting that I.T plays a crucial role in the success of supply chains. Awe et al. (2018) found out that only I.T outsourcing had a very significant impact on firm performance compared to other forms of outsourcing and some 3PL companies such as Touchpath are I.T logistics and supply chain solution experts hence I.T can be argued as an essential part of logistics and supply chain solutions. Solakivi et al. (2011) carried out a study on logistics outsourcing and firm performance in Finland gathering data from 223 manufacturing and trading company which concluded that no gain or loss was made from logistics outsourcing. However, the study noted that I.T logistics outsourcing had the most growth expectations suggesting that I.T outsourcing seems more useful to outsource than other activities.

Theoretical proposition of the research on the difference in levels of logistics outsourcing between developed countries and developing countries with focus on Nigeria

The theory has been discussed in the correlation analysis results and will be further elaborated here. The theory draws from the following parts of the research:

- The literature review.
- Descriptive statistical analysis and t-test results

- The results of the content analysis
- The results of the correlation analysis
- The semi-structured interviews and

Literature review: from the review of the literature, several scholars such as Onyebueke et al. (2019) and Adebambo et al. (2015) acknowledge that risk sharing is among the major motivations for logistics outsourcing in Nigeria (Wang and Regan, 2002). The literature also shows evidence of tactical and integrated logistics outsourcing in developed countries (Arroyo et al., 2006; Financial Times, 2020; Liberto, 2015).

Descriptive statistical analysis and t-test results: the results from the descriptive statistical analysis of levels of logistics outsourcing and the t-test results indicates higher outsourcing of transport related activities with last mile delivery being the most outsourced logistics activity. On the other hand, lower outsourcing of activities such as inventory management, order management, packaging, materials management/handling are observed with inventory management and order management being the least outsourced.

Content analysis: The findings of the content analysis indicate that broad themes related to risks management issues are represented 9 times in the data. Hence 9 sub-themes such as infrastructure risk, security risk, accidental risk, economic risk (2), behaviour risk, staff risk, confidentiality risk, contract risk are all socio-economic, cultural, and infrastructural issues that cause disruptions to supply chains and affects the entire logistics industry with some of these issues deterring foreign 3PLs from operating in Nigeria and limiting further logistics outsourcing. Therefore, these are limitations to the country's overall logistics performance. These problems also make logistics operations less efficient compared to developed countries such as the UK which have more efficient logistic operation. Risks issues such as infrastructure risk, security risk, accidental risk, and economic risks are all less controllable because these are often more determined by external factors such as government economic policies, social and economic

conditions in the country hence organisations tend to outsource mainly transportation related activities as these are more often exposed to these kinds of risks. The other risks mentioned above which are more within the control of organisation tend to make organisations conservative towards outsourcing some logistics activities such as inventory management, order management, customer service so that they can mitigate these risks by controlling the foregoing activities.

Correlation analysis: The results of the correlation analysis showed that there is a high negative correlation between logistics costs and 3PL revenue. This means that a trend is observed from the data which shows that the higher the logistics costs the lower the 3PL revenue and the lower the logistics costs the higher the 3PL revenue. The data showed that developed countries have higher percentage of logistics costs as 3PL revenue and lower percentage of GDP as logistics costs indicating higher logistics outsourcing activities and more efficient aggregate logistics operations. The reverse is the case with developing countries. The research can therefore abduce that in developing countries such as Nigeria where there are less cost-efficient logistics operations, organisations tend to be more conservative towards logistics outsourcing such that they tend to keep activities such as inventory management, packaging, customer service, order processing in which they have more control from these aforementioned limitations in-house and outsource those activities such as transportation related activities in which they have less control so as to share the risks with third-party logistics companies which limits the scope and use of logistics outsourcing. In contrast, in developed countries these limitations are not prevalent hence, the major motivation for outsourcing is not necessarily to share risk though this is one of the reasons for outsourcing. Hence, organisations can outsource any logistics activity so long as it will contribute to achieving the organisation's overall supply chain and business goals. Also, in some cases organisations engage in integrated logistics outsourcing where all logistics activities are outsourced to one 3PL company

hence reducing the average cost of outsourcing each logistics activity. This then tend to lead to higher logistics outsourcing.

Thematic analysis of semi-structured interviews: The participant from the second agricultural company acknowledged in the semi-structured interview that they do not need the expertise of a third-party logistics company to manage its inventory as they can control it in-house effectively. A total of 8 themes related to control are identified from the thematic analysis of semi-structure interviews on section 5.8. through to section 5.8.3 (see section 5.8 through to 5.8.3). This in part is because they can control the outcome of inventory management better than they can control transportation related activities because of the aforementioned limitations which are beyond their full control. The pharmaceutical company also acknowledged in the interview that they keep activities such as inventory management and order processing in-house to monitor them closely to control it and mitigate risks. This implies that they may be risk averse and choose to keep control of such activities not taking risks of leaving it to 3PLs to manage its associated risks. This may be because they have more control over these activities and can effectively mitigate the risks without the need to share it. On the other hand, they have less control over transportation related activities and therefore share the risks and uncertainties with third-party logistics companies. This theory will require further testing in Nigeria using deductive reasoning. This theory meets objectives one and two of this research.

5.10 Assessing the potentialities of the Nigerian third-party logistics market

The research partly aimed at assessing the potentialities of the Nigerian third-party logistics and to develop a Nigerian third-party logistics decision support framework. This was done by investigating the barriers, challenges, problems and the overall practice of third-party logistics across sectors in Nigeria. The nature and type of issues associated with the practice of third-

party logistics indicates where Nigerian 3PL market is at in terms of its level of maturity. It shows areas of improvement that are required to become a more matured market. An analysis of these areas that require improvement shows whether the Nigerian third-party logistics market is realising its potentialities. This analysis is done by discussing possible solutions to the issues identified in the content analysis. The possible solutions to these issues are discussed in the table 5.35 below:

Table 5.36: themes and sub-themes representing the challenges, barriers, and problems of logistics outsourcing in Nigeria and possible solutions.

Themes	Sub-themes	Possible solutions
Risk management	Infrastructure risk	Infrastructure risk such as congested ports and roads are problems that organizations have very limited ability to change hence limited control. Hence, solutions to such problems and how long it may require to be changed are limited to how much infrastructural development the government is making. However, 3PLs with the most advanced logistical and IT capabilities can

		reduce the impact of such risks
Risk management	Security risk	Security risks are also dependent on socio-economic development. However, this risk can be mitigated by advanced intelligence and security capabilities either on the part of the 3PLs or the client or both
Risk management	Accidental risk	Accidental risks are largely due to infrastructural risk and bad driving behaviour in the country. This can also be mitigated by extended driver training and incorporating other extra safety precautions
Risk management	Behaviour risk	Corruption from managers of 3PLs and managers of client companies can be controlled by using procurement software with

		cloud features such that all financial transactions are automated, and visibility is high. This can prevent hidden charges and fees.
Risk management	Confidentiality risk	This risk can also be managed by reducing confidential or sensitive data in transacting with 3PLs. Also, the use of encryption and other data protection methods by 3PLs to protect sensitive business information of their clients. Confidentiality risk is a global problem and can be managed to a limited extent by organizations in Nigeria
Risk management	Economic risks	Economic risks such as underdeveloped third-party logistics market and uncertainty in the business environment are risks which organizations have limited

		control. Hence, solving such problems affecting the practice of third-party logistics depends on how much reforms and developmental policies the government is making
Risk management	Staffing risk	Companies who are engaged in outsourcing logistics in Nigeria can include clauses in employee contracts that lays out employee responsibilities in working with a third-party company. This issue can be well managed by organizations in Nigeria
Risk management	Contract risk	Changes in the regulation of outsourcing contracts can be influenced to a limited extent by associations. Logistics associations and industry associations in Nigeria can influence

		changes in the regulations to protect their interests
Cost efficiency	Operations cost	Cost of business operations in Nigeria is outside the control of 3PLs and companies however, if 3PLs in Nigeria can focus on improving IT and logistical capabilities, overall logistics costs will reduce and become more cost efficient
Service delivery	Vendor capability	3PLs operating in Nigeria have the responsibility to acquire the most advanced IT and logistics capabilities to improve service delivery more efficiently and mitigate risks
Service delivery	Unfavourable working conditions	3PLs operating in Nigeria have the responsibility to ensure favourable working condition emulating from multinational companies. This can help improve 3PL

		staff's productivity levels and overall service delivery of 3PLs
Relationship management	Partnership intervention	Similar to change in management, companies in Nigeria can agree with 3PLs on flexible ways to deal with a new joint venture partnership of the company so that the outsourcing contract can continue to build on gains already made
Relationship management	Organizational culture	Using a third-party logistics multi-criteria decision-making tool can help companies in Nigeria screen and filter 3PL companies to choose a 3PL whose organizational culture and values are similar to the companies
Relationship management	Change management	Organizations and 3PLs in Nigeria can agree in the contract mutually on

		restrictions that can limit contract termination or changes when a new management takes over the organization or holds a significant stake. This is to maintain continuity in building on gains already made and to build stronger ties

Table 5.36 above indicates that the Nigerian 3PL market have growth prospects as around half of the issues are issues that can be managed by organizations. Even some issues outside the ability of organizations to control fully, organizations can still reduce and manage the impact.

As noted in the content analysis however, one of the economic risks identified in the Nigerian case is an underdeveloped third-party logistics market which owes to so many socio-economic challenges keeping the 3PL market largely in the informal sector (Etokudoh et al., 2017). Bank of Industry (2022) noted that the Nigerian informal sector accounted for around 65% of Nigeria's GDP. (World economics, 2020). In Nigeria, logistics outsourcing is largely practiced in the informal sector, but these are often not reported (Etokudoh et al., 2017). The solution to the informal sector is not fully within the control of the private sector. The government needs to implement policies to encourage formalization of all business activities. Economic growth and development will automatically lead to growth in the formal sector.

5.11 LOGISTICS OUTSOURCING DECISION SUPPORT FRAMEWORK

5.11.1 Introduction

The logistics outsourcing decision support framework aims to assess the potential risks and costs of outsourcing the various logistics activities in Nigeria compared with the potential benefits and rewards. The framework is tailored to Nigerian companies by putting into consideration the various socio-economic limitations and risks involved in outsourcing logistics in Nigeria. Also, the indirect and opportunity costs of outsourcing the various logistics activities applicable to each organization are put into consideration. These are then compared with the general benefits of outsourcing logistics drawn from the literature. Each organization in Nigeria then scores these risks/costs and benefits based on how these benefits are specifically applicable to the organization's competitive advantage and overall goals and objectives.

5.11.2 Background

A Likert scale questionnaire was sent to all the 5 research participants to enquire their opinion and attitudes towards developing a decision support framework for organisation who are contemplating whether to outsource or not as this has hardly been done in the literature. The questionnaire enquired to find out what the participants think in terms of its relevance and potential benefits. Out of the five participating organisations only one responded to the questionnaire and their response are in table 5.36 below:

Table 5.37: showing the response of the pharmaceutical company to the idea of a decision support framework

Objectives	1-strongly disagree	2-disagree	3-not sure	4-agree	5-strongly agree
Increased logistics					X

outsourcing activity					
Improved decision making in selecting third party logistics firms			X		
Improved third-party logistics performance				X	
Improved firm performance				X	
Improved relationship and/or contract management				X	

This research is developing and proposing a questionnaire type decision support framework for organizations in Nigeria contemplating whether to outsource, further outsource or to continue outsourcing. The questionnaire style adopted allows the experts to input their experiential opinion by deciding what scores to award the risks and costs and benefits or rewards. The questionnaire style also makes it simplified and easy for experts to provide their opinion and use the framework. The framework is therefore developed systematically to make room for the experiential knowledge inputs from experts in a simplified structured questionnaire form. The purpose of the framework is different from most third-party decision-making frameworks such as those explained above. This is because those frameworks are used to assess and evaluate 3PL companies to decide which one to select while this framework seeks to help organizations decide whether it is worth outsourcing in the first place hence the need to develop a new simplified type of framework.

5.11.3 Cost-benefit analysis concept

Cost-benefit analysis (CBA) is a systematic and analytical process that organisations use for comparing potential benefits and costs with the aim of evaluating the desirability of a project or programme–often of a social or economic nature (Mishan and Quah, 2020). According to Fischhoff (2015), cost-benefit analysis is a systematic process that helps businesses determine which decisions to make and which to forgo. The analysis sums up the benefits and rewards of a decision and subtracts the costs. In some cases, the analysis includes both tangible and intangible costs (such as reduction of employee moral) and includes opportunity cost (Mishan and Quah, 2020). In some cases, the benefits also include intangible benefits (such as improved employee moral). If all things being equal, when the benefits exceed the associated costs, the decision will be positive (Mishan and Quah, 2020).

The underlying concept of this framework is based on cost-benefits analysis as the framework seeks to assess if outsourcing or further outsourcing of logistics activities is beneficial to

organizations in Nigeria. It aims to determine if the organization should outsource or continue to outsource and helps the organizations determine which logistics activities are profitable to outsource. Hence, the results of the application of the framework will determine if logistics outsourcing project is worth doing for a Nigerian organization by weighing the potential benefits and rewards against the potential risks and cost. The framework in itself is not a cost-benefit analysis, but its underlying concept is based on cost-benefit analysis.

5.11.4 Weighting and traffic light system

In this framework, the criteria for deciding to outsource is based on weighting and a set of ratios which determines the organisation's decision in a traffic light manner. Hence, the cost-benefits analysis concept is implemented in this framework using weighting and traffic light method. A set of scores are allocated to the potential costs/risks and benefits/rewards according to the importance of each (weighting). Hence, the scores are not distributed equally to the variables and factors under the cost-benefits categories but according to the importance of each. The importance of each risk/cost or reward/benefit is established based on the findings drawn from the literature review and content analysis. This will be explained further in subsequent section. The total scores awarded to the benefits and rewards by the expert must exceed the total scores awarded to the costs/risks. However, though the scores awarded to the benefits/rewards should exceed the scores awarded to the costs/risks, this however will not always mean that the decision is to outsource. The decision to outsource is rather made based on the percentage with which the scores awarded to the benefits exceed the scores awarded to the costs/risks and this is determined by allocation of weighted ratios. Ratios are allocated to each logistics activity according to their importance (weighting) and divided into three categories in a traffic light manner for decision making. The weighted ratio allocated to each logistics activity are informed by the results of the primary data analyses of this research. The ratios were allocated differently to each logistics activity based on the average level of outsourcing as indicated by the results of

the descriptive statistics. The descriptive statistics indicates that last mile delivery is the most outsourced logistics activities with 80% average level of outsourcing hence the lowest threshold for outsourcing. Warehousing and DTM are second and third with 75% and 65% average level of outsourcing respectively. Both activities are allocated the second lowest threshold for outsourcing. Inbound logistics and I.T. are fourth and fifth most outsourced with 55% and 45% average level of outsourcing respectively. Both activities are allocated the third lowest threshold for outsourcing. Average level of outsourcing customer service is 40%, packaging 35% and material handling 30%. These three activities are allocated higher thresholds. Inventory management and order management both having a 15% average level of outsourcing are allocated the highest thresholds for outsourcing. The threshold interval between one group of logistics activities and the other is made based on the average level of outsourcing as stated above. The interval between each group is 10% but the last group is 20% higher than the previous because of its significantly lower average level of outsourcing.

Table 5.38: Weighted ratios and traffic light system- allocated ratios

Ratio	Interpretation	Allocated logistics activities	Decision
1:1	This mean that the total scores awarded to the benefits of outsourcing must be at least equal to the cost and risks	Last mile delivery	Amber, anything less than this ratio is red
11:10	This means that the total scores awarded to the benefits of outsourcing must exceed the costs and risk by a minimum of 10%	Last mile delivery	Green, anything less than this ratio is amber

11:10	This means that the total scores awarded to the benefits must exceed the cost and risks by a minimum of 10%	DTM and warehousing	Amber, anything less than this ratio is red
6:5	This means that the total scores awarded to the benefits must exceed the cost and risks by a minimum of 20%	DTM and warehousing	Green, anything less than this ratio is amber
6:5	This means that total scores awarded to the benefits of outsourcing a particular logistics activity must exceed the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 20%.	Inbound logistics and IT	Amber, anything less than this ratio is red
13:10	This means that total scores awarded to the benefits of outsourcing a particular logistics activity must exceed the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 30%	Inbound logistics and IT	Green, anything less than this ratio is amber

13:10	This means that the total scores awarded to the benefits of outsourcing a particular logistics activity must exceed the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 30%	Customer service, material handling and packaging	Amber, anything less than this ratio is red
7:5	This means that the total scores awarded to the benefits of outsourcing a particular logistics activity must exceed the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 40%	Customer service, material handling and packaging	Green, anything less than this ratio is amber
7:5	This means that total scores awarded to the benefits of outsourcing a particular logistics activity must exceed the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 40%	Inventory management and order management	Amber, anything less than this ratio is red

3:2	This means that total scores awarded to the benefits of outsourcing a particular logistics activity must exceed the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 50%	Inventory management and order management	Green, anything less than this ratio is amber

5.11.5 Costs and potential risks

There are ten tables representing each logistics activity with questions for the industry expert to answer. Each table consists of the risks and barriers to outsourcing. These refer to those issues associated with logistics outsourcing that can be controlled by the outsourcing organisation and the 3PL company. These issues are based on the findings of the content analysis of the barriers and challenges of logistics outsourcing in Nigeria. Thirty-five percent of total costs and risk scores are allocated to these barriers reflecting its importance to the success of logistics outsourcing in Nigeria as observed in the content analysis.

Also, socio-economic related limitations to the successful achievement of the goals of logistics outsourcing in Nigeria are included in each table. These limitations are also drawn from the content analysis, and they disrupt logistics activities in Nigeria. However, the outsourcing organisations and the 3PLs have limited control over these issues as they are present mainly because of the level of social and economic development of Nigeria. Hence, 20% of the total score are allocated. The industry experts must decide based on their experience how much of the allocated 20% score affect their logistics outsourcing activities. However, the number of these limitations are more in some logistics activities than others. These logistics activities are:

DTM, last mile delivery, inbound logistics, inventory management and order management as these activities involve some form of movement of goods hence are susceptible to issues such as security issues of smuggling and robbery and other issues such as high rate of traffic accidents and congested roads and ports. The foregoing does not change the allocated score however the industry experts based on their experience decides how much of the allocated score applies to these logistics activities.

The costs included in the questionnaire are indirect and opportunity costs of outsourcing and these costs are drawn from the transaction cost economics theory for outsourcing in the literature review (Michael & Michael, 2011; Williamson, 1998; Williamson, 2008). The direct cost such as service fee/contract costs are not included as this varies from 3PL to 3PL hence the price of outsourcing paid to some 3PLs may depending on the 3PL be lower or higher than the cost of performing the logistics activities inhouse hence this may be required when evaluating and selecting 3PLs. The direct cost of outsourcing is therefore not required at this stage. On the other hand, indirect and opportunity costs of outsourcing may have longer term impact on the organisation's goals and objectives (Wang et al., 2017; Zailani et al., 2015).

Indirect costs refer to those internal competencies of the organisation such as financial and non-financial investments made into logistics activities, assets such as warehouse, trucks, delivery vans, technology equipment. Also, indirect costs may include trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs (Kalinzi, 2016; Beimborn, 2006; Dahlman, 1979). Indirect cost is allocated 25%.

Opportunity cost refers to the cost of foregoing an organization's core competencies (competitive advantage) or core business for logistics outsourcing. Hence, it refers to the associated business costs of compromising an organization's core business for outsourcing or

giving up some of the organization's core business activities because of outsourcing (kainzi, 2016). Opportunity cost is allocated 20%.

Table 5.39: Distribution and transportation management (DTM)

Based on your experience, what score will you give each of the following costs and potential risks of outsourcing DTM. High total score may mean that the risks and costs of outsourcing or further outsourcing of customer service may outweigh the benefits and rewards. This depends on the allocated benefits/rewards to costs/risks ratio.

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Employees' reluctance to work with 3PL staff and problems related to staff changes. • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors	/35
Indirect cost: Internal competencies including significant financial and non-financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	/25

Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage)	/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Congested road networks and ports • High rate of traffic accidents • Security issues such as smuggling and robbery. • Uncertain business environment	/20
Total score	

Table 5.40: Warehousing

Based on your experience, what score will you give each of the following costs and potential risks of outsourcing warehousing. High total score may mean that the risks and costs of outsourcing or further outsourcing of customer service may outweigh the benefits and rewards. This depends on the allocated benefits/rewards to costs/risks ratio.

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability	/35

• Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	
indirect cost: Internal competencies including significant financial and non-financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage)	/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Uncertain business environment	/20
Total score	

Table 5.41: Last mile delivery

Based on your experience, what score will you give each of the following costs and potential risks of outsourcing last mile delivery. High total score may mean that the risks and costs of outsourcing or further outsourcing of customer service may outweigh the benefits and rewards. This depends on the allocated benefits/rewards to costs/risks ratio.

Costs (indirect costs and opportunity) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	/35
Indirect cost: Internal competencies including significant financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship and agency costs	/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage)	/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Congested road networks and ports • High rate of traffic accidents • Security issues such as smuggling and robbery.	/20

• Uncertain business environment	
Total score	

Table 5.42: Inbound logistics

Based on your experience, what score will you give each of the following costs and potential risks of outsourcing inbound logistics. High total score may mean that the risks and costs of outsourcing or further outsourcing of customer service may outweigh the benefits and rewards. This depends on the allocated benefits/rewards to costs/risks ratio.

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	/35
Indirect cost: Internal competencies including significant financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	/25

Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage)	/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Congested road networks and ports • High rate of traffic accidents • Security issues such as smuggling and robbery. • Uncertain business environment	/20
Total score	

Table 5.43: IT (Information Technology)

Based on your experience, what score will you give each of the following costs and potential risks of outsourcing information technology. High total score may mean that the risks and costs of outsourcing or further outsourcing of customer service may outweigh the benefits and rewards. This depends on the allocated benefits/rewards to costs/risks ratio.

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management.	/35

• Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	
Indirect cost: Internal competencies including significant financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage)	/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Uncertain business environment	/20
Total score	

Table 5.44: Customer service

Based on your experience, what score will you give each of the following costs and potential risks of outsourcing customer service. High total score may mean that the risks and costs of outsourcing or further outsourcing of customer service may outweigh the benefits and rewards.

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	/35
Indirect cost: Internal competencies including significant financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage)	/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Uncertain business environment	/20
Total score	

Table 5.45: Material handling

Based on your experience, what score will you give each of the following costs and potential risks of outsourcing material handling. High total score may mean that the risks and costs of outsourcing or further outsourcing of customer service may outweigh the benefits and rewards. This depends on the allocated benefits/rewards to costs/risks ratio.

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	/35
Indirect cost: Internal competencies including significant financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage)	/20
Social-economic limitations:	/20

• Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Uncertain business environment	
Total score	

Table 5.46: Packaging

Based on your experience, what score will you give each of the following costs and potential risks of outsourcing packaging. High total score may mean that the risks and costs of outsourcing or further outsourcing of customer service may outweigh the benefits and rewards. This depends on the allocated benefits/rewards to costs/risks ratio.

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	/35

Indirect cost: Internal competencies including significant financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage)	/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Uncertain business environment	/20
Total score	

Table 5.47: Inventory management

Based on your experience, what score will you give each of the following costs and potential risks of outsourcing inventory management. High total score may mean that the risks and costs of outsourcing or further outsourcing of customer service may outweigh the benefits and rewards. This depends on the allocated benefits/rewards to costs/risks ratio.

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management.	/35

• Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	
Indirect cost: Internal competencies including significant financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship and agency costs	/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage)	/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Congested road networks and ports • Security issues such as smuggling and robbery. • High rate of traffic accidents • Uncertain business environment	/20
Total score	

Table 5.48: Order management

Based on your experience, what score will you give each of the following costs and potential risks of outsourcing order management. High total score may mean that the risks and costs of

outsourcing or further outsourcing of customer service may outweigh the benefits and rewards. This depends on the allocated benefits/rewards to costs/risks ratio.

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	/35
Indirect cost: Internal competencies including significant financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship and agency costs	/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage)	/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market.	/20

• Congested road networks and ports • Security issues such as smuggling and robbery. • High rate of traffic accidents • Uncertain business environment	
Total score	

5.11.6 Benefits and rewards of logistics outsourcing

The five potential benefits and rewards of outsourcing logistics represented in the table 12 below are drawn from the literature review and content analysis. The scores allocated to each benefit are based on the frequency of occurrence in the literature. The frequency of occurrence in this research are represented by the authors in table 4.48 below:

Table 5.49: benefits of logistics outsourcing, reported by scholars and the frequency of occurrence in the literature review and content analysis of this research.

No.	Benefits and rewards	Authors	Frequency of occurrence	Percentage allocation %
1	Cost savings/reduction in capital investment	Quelin & Motlow (1998), Wang and Regan (2002), Adebambo et al., (2015), Buyukozkan et al., (2007), Konig and Spinler (2016), Nunez-Carballosa and Guitart-Tarres, (2011) Jain et al. (2022), Curea (2016), Cichosz et al.	11	30

		(2017), Etokudoh et al. (2017), Bask (2001)		
2	Focus on core competence	Zailani et al. (2015), Horsefall et al. (2018), Wang and Regan (2002), Ezenwa et al., (2018), Liberto, (2015), Arroyo et al. (2006), Marchet et al. (2017), Yang & Lindsay (2011), Li-Jun, (2012), Bask (2001)	10	30
3	Risk sharing	Wang and Regan (2002) Onyebueke et al., (2019), Adebambo et al. (2015)	3	15
4	Access to 3PL expertise/competence and resources	Wang and Regan (2002) Etokudoh et al. (2017), Bask (2001)	3	15
5	Quality improvement and service delivery	Gotzamani et al. (2010), Bask (2001)	2	10

Hence cost savings/reduction in capital investments are allocated 30%, focus on core competence 30%, risk sharing 15%, access to 3PL expertise and resources 15% and improved service delivery 10% as seen in table 4.49 below:

Table 5.50: allocated scores to benefits of logistics outsourcing.

Logistics activity	Cost savings/reduction in capital investments- 30	Focus on core competence- 30	Risk sharing- 15	Access to 3PL expertise/competence and resources- 15	Improved service delivery - 10	Total score
DTM						
Warehousing						
Last mile delivery						
Inbound logistics						
IT (e.g., tracking)						
Customer service						
Material handling						
Packaging						
Inventory management						
Order management						

5.11.7 Decision whether to outsource/further outsource or not

Table 5.51: decision whether to further outsource or keep in-house.

Logistics activity	Costs/risks total score	Benefits/rewards total score	Apply allocated ratio	Decision
DTM				
Last mile delivery				
Warehousing				
Inbound logistics				
IT				
Customer service				
Material handling				
Packaging				
Inventory management				
Order management				

6.0 CHAPTER SIX: CONCLUSIONS, RECOMMENDATIONS AND RESEARCH OUTPUT CHAPTER

6.1 Research conclusions and recommendations

Basic logistics functions such as Distribution and Transportation management and other transportation related activities has the highest share of outsourced logistics activity globally (Report Linker, 2020). The study therefore further concludes that Distribution and Transportation related activities are the most outsourced logistics activities in Nigeria and similar developing countries (Macharia et al., 2016). These conclusions are drawn from the Report Linker (2020) report which was featured in the content analysis of this research, from literature review and from the results of the statistical analyses of primary data. Furthermore, the statistical analyses of the primary data shows that last mile delivery which was referred to as outbound logistics in this study is the most outsourced logistics activity. The statistical analyses of primary data also indicates that the least outsourced logistics activities are inventory management and order management.

Developed economies offer more complex and integrated third-party logistics services where third-party logistics companies provide integrated and value added service therefore going beyond the provision of basic logistics activities such as distribution and transport management, last mile delivery, warehousing, to more advanced services such inventory management, order management and processing, supply chain simulation and modelling, handling and packaging, customer service, demand management and engineering services such as warehouse build and/or design; high technology equipment installation and specialist equipment.

Organisations in Nigeria outsource logistics among other reasons to share risks with third-party logistics companies. This is evidenced from the literature review (Onyebueke et al., 2019; Adebambo et al., 2015). In Nigeria, from data collected, organisations tend to keep activities

that they can control in-house compared to activities where they might need expertise to accomplish so as to mitigate any potential risks. Hence, they tend to share the potential risks of these activities such as transportation related activities with third party logistics companies as these activities are more prone or exposed to risks such as congested roads networks and ports, high rate of traffic accidents, security issues such as smuggling and robbery. The foregoing takeaway was drawn from the findings of the content analysis and the semi-structured interviews from three participants using abductive reasoning. The decision support framework was tested as noted in the methodology section with the pharmaceutical company and their response indicates that the scores awarded to last mile delivery in the risks and cost section is the highest compared to other logistics activities. This owes to the high score awarded to the socio-economic and infrastructural limitations and risks (see appendix 5). Furthermore, last mile delivery is the most outsourced logistics which corresponds to the tentative theory postulated by this research that such transport related logistics activity as last mile delivery is more susceptible to the risks and limitations associated with logistics operations in Nigeria having more severe impact on the organisation's business performance hence the need to share the risks and costs with a third-party logistics provider. Also, after inputting the awarded scores into the allocated ratios the results shows that only last mile delivery should be outsourced because of significantly higher scores awarded to the benefits of outsourcing the activity including risk sharing (see appendix 5).

On the other hand, the aforementioned risks prevalent in developing countries such as Nigeria are not prevalent or significant in developed countries (evidenced in the UK context from the content analysis) hence organisations are willing to outsource all logistics activities at an integrated level such that cost per activity is reduced and performance is optimized. This takeaway is drawn from the literature review and the content analysis.

In contrast to the foregoing, in Nigeria, activities such as inventory management and order processing though may also be affected by supply chain disruptions as these might affect how much goods can be stored in retail stores and may affect order fulfilment respectively. However, organisations in Nigeria can better control these activities and manage the associated risks than they can control transportation related activities because of the nature of these activities. The foregoing takeaway was drawn from the content analysis and from the interviews.

The third-party logistics market in Nigeria therefore is still at its maturing or developing stage (Etokudoh et al., 2017; Armstrong and Associates, 2020; Statista, 2020) hence opportunities for growth in outsourcing logistics activities such as inventory management and order processing/management abound in Nigeria if these activities are provided together with other services such as transportation related, warehousing, customer service, material handling and packaging. This will require third-party logistics companies to expand their expertise so that they are able to provide integrated logistics activities. This will then reduce the average cost of providing the individual logistics activities and more cost efficient for organisations. Furthermore, if third party logistics companies in Nigeria can expand their expertise and service offering to include more advanced and complex logistics activities such as inventory management, order management, supply chain simulation and modelling, materials handling, and packaging, high technology equipment installation, warehouse design and build and specialist equipment especially to large corporations, this may increase the overall market for third party logistics services and consequently 3PL revenues. The foregoing recommendation is limited in it applicability as the informal sector makes up 65% of Nigeria's GDP and these complex and integrated services are not applicable to the informal sector.

A theory is proposed from the results of the various methods that were used in this research. The proposed theory postulates that developing countries such as Nigeria where there are less cost-efficient logistics operations, organisations tend to be more conservative towards logistics

outsourcing such that they tend to keep activities such as inventory management, packaging, customer service, order processing in which they have more control from these aforementioned risks in-house and outsource those activities such as transportation related activities in which they have less control so as to share the risks with third-party logistics companies. In contrast, in developed countries these limitations are not so significant as seen in the content analysis in the UK context. Hence the major motivation for outsourcing is not necessarily to share risk though this is one of the reasons for outsourcing. Hence, organisations can outsource any logistics activity as long as it will contribute to achieving the organisation's overall supply chain and business goals. Also, in some cases organisations engage in integrated logistics outsourcing where all logistics activities are outsourced to one 3PL company hence reducing the average cost of outsourcing each logistics activity. This then tend to lead to higher logistics outsourcing.

In assessing the potentialities of the Nigerian 3PL market, the research abduced that the market has growth prospects as around half of the issues identified in the content analysis are issues that can be managed by organizations. The Nigerian 3PL market however remains underdeveloped due to the large informal sector which accounts for 65% of the Nigerian GDP.

6.2 Reconciling Research Conclusions with Research Questions and Objectives

Below is a summary of how each research question of each objective have been answered from the findings that were discussed in the analysis chapter. Each research objective is laid out with its corresponding research questions and summary of how these questions have been answered.

Objective One

To examine the barriers and challenges to the practice of third-party logistics in Nigeria in order to provide a better understanding of the situation in Nigeria **Question one**: *What are the key barriers and challenges experienced by third-party logistics providers in Nigeria*?

In the Nigerian context, the following are the key barriers and challenges: infrastructure risks such as congested road networks causing supply chain disruptions. Accidental risk such as high rate of traffic accidents disrupting supply chains and preventing more foreign 3PL companies from entering the Nigerian market. Underdeveloped third-party logistics market in terms methods of operation, relationship management and a large informal sector. Contract risk such as inadequate regulations of the Nigerian third-party logistics industry in terms outsourcing contracts discouraging further logistics contracting. Security risks such as smuggling and robbery causing supply chain disruptions and preventing more foreign 3PL companies from entering the Nigerian market. Behavioural risk such as corruption and dishonesty recognised as a cultural issue that raises issues of trust among organisations preventing them from outsourcing their logistics activities. Confidentiality risk in terms of poor information flow management by 3PLs and risk of exposure of 3PL's customer secrets to competitors. Also, cost issues in terms of high cost of business operations and economic risk such as uncertain business environment resulting from unstable economic conditions and unstable economic policies causing supply chain disruptions.

- **Question two**: *Are there cultural, socio-economic, or infrastructural factors that contribute to the barriers and challenges of logistics outsourcing in Nigeria*?

  Corruption among managers of 3PL customers to collaborate with 3PL companies to include hidden charges in exchange for percentage cuts. These kinds of behaviours are socio-economic and cultural issues, and they discourage some organisations from

outsourcing logistics activities as reported in the content analysis. These kinds of behaviours are considered cultural as they are prevalent within developing country contexts as same challenge was also observed in a case study of Ugandan 3PL market (Kalinzi, 2015). Other socio-economic issues include robbery and smuggling and high rate of traffic accidents. Infrastructural issues include congested road networks as reported in the content analysis.

- **Question three**: *What practices can be drawn from the developed 3PL markets to help in dealing with the barriers and challenges in the Nigerian third-party logistics industry*?

  Integrated logistics outsourcing practises making each logistics activities less expensive to outsource, outsourcing tactical and strategic logistics functions by organisations such as inventory management, order management and customer service. Third-party logistics companies can include more value-added service offering such as engineering services, simulation, high equipment installation.

Objective two

To investigate the motivation and aims for outsourcing in Nigeria providing explanations for lower levels of logistics outsourcing in Nigeria compared to developed countries.

- **Question one**: *What are the motivating factors for logistics outsourcing activities among companies in Nigeria*?

  The literature review part three indicates that organisations in Nigeria outsource to share risks, cut costs and to focus on their core competencies. The semi-structured interviews shows that organisations outsource to focus on core competencies and to share risks. The interviews also show that organisation outsource to utilise the expertise of 3PLs where required.

- **Question two**: *What are the key factors that contribute to the lower levels of logistics outsourcing in Nigeria compared to developed countries*?

  In Nigeria, drawing from the literature review, content analysis and theoretical proposition, risk sharing largely determines which logistics activities are outsourced because of the economic and infrastructural limitations inherent in such logistics activities in Nigeria such as transportation. This limits organisations to outsource for risk sharing and not mainly for cutting costs or for strategic purposes thereby limiting the use and gains of logistics outsourcing. On the other hand, in the developed markets, organisations are not limited to outsourcing logistics activities mainly to control risks, but they outsource any logistics activity that will enable them to reduce costs and focus on their core competencies hence the use and gains from logistics outsourcing are not limited.

- **Question three**: *How do cultural, socio-economic, and infrastructural factors influence the decision to outsource logistics activities across sectors in Nigeria*?

  Cultural and socio-economic issues such as corrupt and dishonest behaviours from managers of 3PL customers to collaborate with 3PL companies to add hidden charges for percentage cuts as reported in the content analysis raises issues of trust in the third-party contract and relationship management hence influencing decisions not to outsource. Also, the correlation analysis showed a high negative correlation between logistics costs and level of logistics outsourcing in developed and developing countries. In developing countries such as Nigeria where there are higher logistics costs, logistics outsourcing tends to be lower. The economic and infrastructural limitations in Nigeria influence the decision to outsource certain logistics activities such as transportation related activities to share risks associated with such logistics activities. These risks such as high rates of traffic accidents, congested road networks and smuggling and robbery are all because of infrastructural and socio-economic limitations and challenges.

Objective three

To investigate the levels of outsourcing of the various logistics activities across sectors in Nigeria

- **Question one**: *Which specific logistics activities are most outsourced in Nigeria across sectors*?

  The descriptive statistics and statistical t-test showed that last mile delivery is the most outsourced logistics activity. Also, warehouse storage and management, and distribution of goods are the second and third most outsourced logistics activities respectively.

- **Question two**: *What factors are responsible for the decision to outsource specific logistics activities than others in different sectors in Nigeria*?

  The thematic analysis of semi-structured interviews showed that risk sharing is the major factor responsible for the higher outsourcing of transportation related activities in the agricultural sector. While for inventory management and packaging, the expertise of 3PLs is not required. For order processing, the seasonal nature of the business makes it easier to predict demand hence no need for the expertise of 3PLs. For material handling, the skills and expertise of 3PLs are also not required as these organisations can better perform this activity inhouse. Furthermore, in the pharmaceutical industry, the semi-structured interviews showed that they tend to outsource activities that are not directly related to or contributing to the success of their core business activity and of which they are unable to fully control and mitigate risks independently. For fast moving consumer goods (FMCG) and manufacturing companies did not grant us further interviews after structured interviews and questionnaires. However, data collected through structured interview with the FMCG showed that they operate in all 36 states at very large scales suggesting that they require the expertise and skills of 3PLs to manage their logistics activities so that they can focus on their core business activity which is manufacturing

and reselling of fast-moving consumer goods. These include activities such as inventory management and order management which are less outsourced in other sectors represented.

Objective four

To develop based on the findings of the research, a decision support framework, which may be used where applicable as a tool for making third-party logistics outsourcing pre-selection decisions Nigeria.

- **Question one**: *What are the key factors that should be considered when considering making logistics outsourcing decisions in the Nigerian context*?

  According to the decision support framework, the key factors to be considered when making logistics outsourcing decisions include considerations of the potential risks and costs of outsourcing compared to the potential benefits and gains of logistics outsourcing based on a cost benefits analysis concept. The potential risks/costs and benefits/rewards were drawn from the literature review, content analysis and original primary data analysis. Based on the Nigerian context, the risks include socio-economic and infrastructural issues such as corruption and dishonesty, smuggling and robbery, congested road networks and ports and high rate of traffic accidents. The costs include indirect costs and opportunity costs as listed in the decision support framework. The benefits include potential cost savings and reduction in capital investment, increased productivity from focusing on core competency of the organisation, risk sharing, access to 3PL expertise and quality improvement and improved service delivery.
- **Question two**: *How can the logistics outsourcing decision support framework effectively guide companies in evaluating the potential benefits and risks of logistics outsourcing in Nigeria*?

On the basis of the findings of this research, organisations will need to consider the following to be guided effectively when using the decision support framework:

The organisation core business activity which determines what business activity to focus on for productivity and what business or logistics activity to outsource. The foregoing is evidenced from the literature review, content analysis and the semi-structured interview with the pharmaceutical company. It also determines what business activity is very important to the organisation's core business activity and requires close monitoring and control by the organisation as evidenced from the semi-structured interview with the pharmaceutical

Second, Core competence or competitive advantage of the organisation determines what activities that can never be outsourced as these activities are the unique selling point of the organisation. Organisations can carry out activities based on its core competence with minimal resources and high productivity thereby achieving efficiency. Hence, such activity is best done inhouse. The foregoing is evidenced in the literature on outsourcing.

Third, the scale of the logistics activity to be considered for outsourcing as this determines whether the organisation needs the skills and expertise of a third-party logistics companies to effectively manage the activity. The foregoing is evidenced in the thematic analysis of semi-structured interview with the agricultural companies.

Fourth, as evidenced from the literature review, content analysis and thematic analysis of semi-structured interviews, logistics activities that are susceptible to socio-economic and infrastructural limitations which are outside the control of organisations determines which logistics activity will be strategic to outsource to share risks.

- **Question three**: *What are the specific criteria, parameters and metrics that should be incorporated into the decision support framework to facilitate informed logistics outsourcing decisions among companies in Nigeria*?

Literature shows evidence of previous third-party logistics decision making framework for selecting third-party logistics companies that utilized weighted ratios, criteria, and scores. Hence, the third-party logistics decision support framework utilized weighted scores and ratios as criteria and parameters and decisions are made based on a traffic light system. The foregoing are as follows: weighted scores allocated to each risk; weighted scores allocated to each cost; weighted scores allocated to each benefit and rewards of outsourcing, and weighted ratios allocated to each logistics activity.

6.2.1 Achievement of research objectives using mixed methods triangulation

Objective 1: *To examine the barriers and challenges to the practice of third-party logistics in Nigeria in order to provide a better understanding of the situation in Nigeria*.

This objective was met using content analysis, correlation analysis and supported by the literature review. The content analysis is a qualitative method. Findings suggests that there are socio-economic limitations that make logistics operations in Nigeria less efficient affecting logistics outsourcing in Nigeria hence lower use of 3PLs. This is similar to findings from the correlation analysis. The correlation analysis indicates that similar developing countries such as Nigeria with less efficient logistics operations always tend to use less of 3PL services.

Objective 2: *To investigate the motivation and aims for outsourcing in Nigeria providing explanations for lower levels of logistics outsourcing in Nigeria compared to developed countries.*

This objective was met using thematic content analysis of semi-structured interviews, content analysis of secondary data and correlation analysis supported with literature review. The findings from qualitative methods such as thematic content analysis of semi-structure interviews and content analysis of secondary data indicate that companies outsource logistics in Nigeria to share risk, cut costs, focus on core competence, and utilize the expertise of 3PLs. This is

supported by the literature review. Findings from qualitative methods such as content analysis further show that soft socio-economic factors such as corruption and bribery discourage outsourcing hence the lower use of 3PLs. Also, risk sharing is a major motivation for outsourcing because of the inherent economic and infrastructural limitations. Lower logistics efficiencies also tend to make organisations in Nigeria more conservative towards outsourcing. The foregoing is corroborated by findings from the correlation analysis, which is a quantitative method. The findings indicate that developing countries such as Nigeria with lower logistics operations efficiencies always tend to outsource less. This corroborates with the findings from the qualitative methods which indicates that lower logistics operations inefficiencies are a result of the aforementioned socio-economic and infrastructural limitations.

Objective 3: *To investigate the levels of outsourcing of the various logistics activities across sectors in Nigeria*.

This objective was met using descriptive statistical analysis, statistical t-test, and thematic content analysis of semi-structured interviews. The findings from the descriptive statistics and t-test indicates that organisations in Nigeria tend to outsource more transportation related activities. The foregoing is also confirmed from the qualitative thematic content analysis of semi-structured interviews which indicates that organisations outsource more of transportation related activities to share risks as these activities are often associated with risks beyond their control. The risks refer to the socio-economic and infrastructural limitations in which organisations have less control.

Objective 4: *To develop based on the findings of the research, a decision support framework/tool, which may be used where applicable as a guide for facilitating logistics outsourcing decisions for companies in Nigeria*.

This objective has been met through the logistics outsourcing decision support framework, content analysis, literature review and the primary data analysis. The findings of the content analysis were used to develop the decision support framework. The decision support framework was developed based on weighted criteria in the form of weighted scores and weighted ratios. The weighting was drawn from the results of the other methods applied in the research. they are outlined below:

- The weighted scores allocated to the risks are weighted based on the findings of the content analysis.
- The weighted scores allocated to the costs are weighted based on the findings from the literature review.
- The weighted scores allocated to the benefits and rewards are based on the findings from the literature review and
- the weighted ratios are drawn from the results of the statistical analysis of primary data

6.3 Contribution to knowledge and practice

1. First, the research throws light on the indirect and opportunity costs involved in outsourcing through the transaction cost economics theory to outsourcing such as: internal competencies including significant financial and non-financial investments, assets, and trained logistics personnel. Other indirect cost includes search and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs. Opportunity cost involves when the outsourced logistics activity could have been a major or core competence of the organisation if it was kept inhouse. These are discussed in the literature review and applied in the logistics outsourcing decision support framework. This is important as

most studies have focused on the direct cost of providing the outsourced logistics service or the cost of the contract.

2. Also, while previous studies on third-party logistics in Nigeria tend to focus only on one sector, this research involves a multisectoral investigation of third-party logistics practice in Nigeria.
3. New third-party logistics decision support framework that evaluates the profitability and viability of embarking on logistics outsourcing for organisations in Nigeria. This is novel as most studies have previously focused on a decision-making framework that helps organisations in the selection process of a suitable third-party logistics company.
4. Companies in Nigeria can readily begin incorporating the decision support framework in their decision making.
5. A tentative theory is built which assumes that part of the reasons for the lower practice of logistics outsourcing in developing countries such as Nigeria is because of the existing limitations to the expected positive business impact of logistics outsourcing. These limitations are a result of socio-economic developmental issues. The foregoing theory can be examined in a further study using deductive approach.

6.4 Recommendations for further study

The decision support framework may be tested in post doctorate research by distributing it to a wide range of companies across various sectors in Nigeria and their response may be analysed using correlation analysis and ANOVA to determine its applicability and validity. While the framework has been tested with the input of the pharmaceutical company as seen in appendix 5, a further testing is required from a large data set to establish its usability, further establish the ratios or thresholds for decision making and to establish its validity.

After testing the applicability of the decision support framework in Nigeria, a further study can possibly be carried out to generalise its applicability to other similar developing countries with similar socio-economic and infrastructural characteristics as Nigeria using an inductive approach.

Also, the decision support framework as a tool that can support organisations in evaluating the viability and profitability of embarking on logistics outsourcing can further be adapted and tested in different developed country contexts in a further study.

Also, further research can be built on the findings of this study to carry out a test of difference (ANOVA or statical t-test) to determine what logistics outsourcing activities are more likely to be outsourced in some sectors than others.

A further test of difference may also be used to determine what motivating factors for logistics outsourcing are more applicable to some sectors than others in further research.

Furthermore, a further test of association or correlation may be done in further research to determine the relationship between the motivating factors for logistics outsourcing in a specific sector in Nigeria such as testing the association between cost saving and the level of logistics outsourcing within organisations in that sector.

List of References

Abosag, I., Yen, D.A., and Barnes, B.R. (2016) What is dark about the dark side of business relationships? *Industrial Marketing Management*, 55(5), pp. 5-9.

Adebambo, O., Omolola, M. & Victor, A. (2015) Impact of logistics outsourcing services on company transport cost in selected manufacturing companies in Southwestern Nigeria, *European Journal of Logistics, Purchasing and Supply Chain Management,* 3(4), pp. 30-41.

Adesunkanmi, S.O., Emmanuel, O.I. and Nurain, S.A., (2022) Effect of Logistics Outsourcing on Operational Performance of the Selected Manufacturing Companies in Southwestern Nigeria, *Open Journal of Business and Management*, *10*(6), pp. 3485-3499.

Afum, E., Agyabeng-Mensah, Y., Acquah, I.S.K., Baah, C., Dacosta, E., Owusu, C.S. and Amponsah Owusu, J. (2021) Examining the links between logistics outsourcing, company competitiveness and selected performances: the evidence from an emerging country. *The International Journal of Logistics Management*, *32*(3), pp. 1068-1090.

Agburu, J.I., Anza, N.C. and Iyortsuun, A.S. (2017) Effect of outsourcing strategies on the performance of small and medium scale enterprises (SMEs), *Journal of Global Entrepreneurship Research*, 7(1), pp. 26-61

AGL (2023) AGL (AFRICA GLOBAL LOGISTICS) at the heart of Africa's transformation. Available at: https://www.aglgroup.com/en/agl-africa-global-logistics-at-the-heart-of-africas-transformation/ [Accessed 30 July 2024].

Aigbavboa, S. and Mbohwa, C. (2020). The murky waters of outsourcing: critical risks factors of outsourcing pharmaceutical outbound value chains, *Procedia Manufacturing*, *43*, pp. 328-335.

Aigbavboa, S. and Mbohwa, C. (2020). The headache of medicines' supply in Nigeria: an exploratory study on the most critical challenges of pharmaceutical outbound value chains. *Procedia Manufacturing*, *43*, pp. 336-343.

Aigbavboa, S. and Mbohwa, C. (2019) November. Going the extra mile: vital third-party logistics service providers' pre-selection activities by pharmaceutical organizations, In *IOP Conference Series: Materials Science and Engineering* (Vol. 640, No. 1, p. 012126). IOP Publishing.

Aguezzoul, A. (2014) Third-party logistics selection problem: A literature review on criteria and methods, *Omega*, 49(0), pp. 69-78.

Aguezzoul, A. (2007) The Third-Party Logistics Selection: A Review of Literature, *International Logistics and Supply Chain Congress*, November, Istanbul, Turkey. pp. 1-7. hal-00366527

Ahn, W.C., Ishii, S., and Ahn, S.B. (2013) A comparative study of Korean and Japanese logistics industries' market structures: Focusing on subsidiary and third-party logistics companies, *The Asian Journal of shipping and logistics*, 29(3), pp. 361-376.

Akaaboune, A., Caskey, K. and Akaaboune, O. (2018) Third-Party Logistics Provider Choice in Emerging Markets, *Journal of Competitiveness Studies*, 26(3-4), pp. 134-152.

Agrawal, S., and Singh, R.K., (2021) Outsourcing and reverse supply chain performance: a triple bottom line approach, *Benchmarking,* 28(4), pp. 1146-1163.

Asthana, S. and Dwivedi, A. (2020) Performance measurement of India-based third-party logistics sector: an empirical study of user versus provider perspectives, *Production planning & control*, *31*(2-3), pp. 259-272.

Asthana, S., Bhat, H. and Singh, R. (2015) A Study of Business Performance Measurement of Third-Party Logistics (3PL) Organizations in the Indian Logistics Industry, *IMS Manthan-The Journal of Innovation*, X, pp. 105-110.

Altekar, R. V. (2012) *Supply chain management: concept and cases*. New Delhi: PHI Learning Private Limited.

Akman, G. and Baynal, K. (2014) Logistics service provider selection through an integrated fuzzy multicriteria decision making approach, *Journal of Industrial Engineering*, 2014(794918), pp. 1-16.

Akbari, M., Ha, N. and George, M. (2020) The role of logistics service providers in sustainable fashion supply chains, In *Supply Chain Management and Logistics in the Global Fashion Sector* (pp. 67-94), Routledge.

Akyuz, G. and Erkan, T. (2010) Supply chain performance measurement: a literature review, *International journal of production research*, 48(17), pp. 5137-5155.

Alewell, D., Bähring, K., Canis, A., Hauff, S. and Thommes, K. (2007) Outsourcing HR functions: Development of an explanatory approach to firms'(non-existent) demand for personnel services, *management review*, pp. 271-292.

Alkhatib, S.F., Darlington, R. and Nguyen, T.T. (2015) Logistics service providers (LSPs) evaluation and selection, *Strategic Outsourcing: An International Journal*, pp. 102-134.

Alvesson, M. and Karreman, D. (2007) Constructing Mystery: Empirical Matters in Theory Development, *Academy of Management Review*, 32(1), pp. 1125-1149.

Anderson, E.J., Coltman, T., Devinney, T.M. and Keating, B. (2011) What drives the choice of a third-party logistics provider? *Journal of Supply Chain Management*, 47(2), pp. 97-115.

Anderson, D. and Norman, A. (2002) Procurement of logistics services - a minute's work or a multi-year project?" *European Journal of Purchasing & Supply Management*, 8(1), pp. 3-14.

Ansari, A. and Modarress, B. (2010) Challenges of outsourcing logistics to third-party providers, International Journal of Logistics Systems and Management, 7(2), pp. 198-218.

Akpınar, M.E. (2021) Third-party logistics (3PL) provider selection using hybrid model of SWARA and WASPAS, *International Journal of Pure and Applied Sciences*, *7*(3), pp. 371-382.

Arif-Uz-Zaman, K. and Nazmul Ahsan, A. (2014) Lean supply chain performance measurement, *International Journal of Productivity and Performance Management,* 63(5), pp. 588-612. https://doi.org/10.1108/IJPPM-05-2013-0092

Arroyo, P., Gaytan, J. and De Boer, L., (2006) A survey of third-party logistics in Mexico and a comparison with reports on Europe and USA, *International Journal of Operations & Production Management*, 26(6), pp. 639-667.

Awe, O.A., Kulangara, N. and Henderson, D.F. (2018) Outsourcing and firm performance: a meta-analysis, *Journal of Strategy and Management*, 11(3), pp. 371-386.

Aziz, A., Memon, J.A. and Ali, S. (2020) Logistics capability, logistics outsourcing and firm performance in manufacturing companies in Pakistan, *The Journal of Asian Finance, Economics and Business*, *7*(8), pp. 435-444.

Ayers, B. (2001) *Handbook of Supply Chain Management*. Boca Raton Fla.: The St. Lucie Press/APICS Series on Resource Management

Armstrong & Associates (2023) Armstrong & Associates Inc. Available at: https://www.3plogistics.com/3pl-market-info-resources/3pl-market-information/global-3pl-market-size-estimates/ [Accessed on 25 November 2023]

Barney, J.B. and Wright, P.M. (1998) On becoming a strategic partner: The role of human resources in gaining competitive advantage, Human Resource Management: Published in Cooperation with the School of Business Administration, The University of Michigan and in alliance with the Society of *Human Resources Management*, 37(1), pp. 31-46.

Barney, J., Wright, M. and Ketchen Jr, D.J. (2001) The resource-based view of the firm: Ten years after 1991, *Journal of management,* 27(6), pp. 625-641.

Barney, J.B. (2001) Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view, *Journal of management*, 27(6), pp. 643-650.

Baškarada, S. and Koronios, A. (2018) A philosophical discussion of qualitative, quantitative, and mixed methods research in social science, *Qualitative Research Journal,* 18(1), pp. 2-21.

Bask, A. (2001) Relationships among TPL providers and members of supply chains – a strategic perspective, *Journal of Business & Industrial Marketing*, 16(6), pp. 470-486. https://doi.org/10.1108/EUM0000000006021

Bask, A.H. and Juga, J. (2001). Semi-integrated supply chains: towards the new era of supply chain management, *International Journal of Logistics*, *4*(2), pp. 137-152.

Bell, E., Bryman, A. and Harley, B. (2022) *Business research methods*, 6th edn., Oxford University Press: Oxford.

Beamon, B. (1999) Measuring supply chain performance, *International Journal of Operations & Production Management,* 19(3), pp. 275-292. https://doi.org/10.1108/01443579910249714

Beamon, B. (1998) Supply Chain design and analysis: Models and methods. [Online] Available: http://www.damas.ift.ulaval.ca/~moyaux/coupfouet/beamon98.pdf (July 21, 2011).

Beimborn, D. (2006) A Model for Simulation Analyses of Cooperative Sourcing in the Banking Industry, *Proceedings of the 39th Hawaii International Conference on System Sciences*.

Bolumole, Y.A. (2001) The supply chain role of third-party logistics providers, *The International Journal of Logistics Management*, 12(2), pp. 87-102.

Bowersox, D. J., Closs, D. J., Cooper, M. B., Bowersox, J. C. (2002) *Supply Chain Logistics Management.* 4th ed. New York: McGraw-Hill.

Bowersox, D.J. (1990) Strategic benefits of logistics alliances, *Harvard Business Review*, 68(7-8), pp. 36-45.

Boyson, S., Corsi, T., Dresner, M. and Rabinovich, E. (1999) Managing effective third-party logistics relationships: What does it take? *Journal of Business Logistics*, 20(1), pp. 73-100.

Bridge Field Group (2006) Bridge Field Group ERP/Supply Chain (SC) glossary. [Online] Available at: http://bridgefieldgroup.com/bridgefieldgroup/glos7.htm#P [Accessed June 2, 2021].

Büyüközkan, G., Feyzioğlu, O. and Nebol, E. (2008) Selection of the strategic alliance partner in logistics value chain, *International Journal of Production Economics*, *113*(1), pp. 148-158.

Capper, C.A. (2018). *Organizational theory for equity and diversity: Leading integrated, socially just education*. Routledge.

Chan, F.T.S. (2003) Performance Measurement in a Supply Chain, *The International Journal of Advanced Manufacturing Technology*, 21(7), pp. 534-548. DOI: 10.1007/s001700300063.

Chang, J.P., Su, Y., Skibniewski, M.J. and Chen, Z.S. (2024) Evaluating potential quality of e-commerce order fulfilment service: A collective intelligence-driven approach. *Information Sciences*, *666*, p.120425.

Charles, M. and Ochieng, S.B. (2023) Strategic outsourcing and firm performance: a review of literature, *International Journal of Social Science and Humanities Research (IJSSHR) ISSN 2959-7056 (o); 2959-7048 (p)*, *1*(1), pp. 20-29.

Chiang, Z. and Tzeng, G.H. (2009) A Third-Party Logistics Provider for the Best Selection in Fuzzy Dynamic Decision Environments, *International Journal of Fuzzy Systems*, 11(1), pp. 1-9.

Chi-kuang, C., Palma, F. and Reyes, L. (2019) Reducing global supply chains' waste of overproduction by using lean principles, *International Journal of Quality and Service Sciences,*11(4), pp. 441-454.

Cichosz, M., Goldsby, T.J., Knemeyer, A.M. and Taylor, D.F. (2017) Innovation in logistics outsourcing relationship-in the search of customer satisfaction, *Log Forum*, 13(2), pp. 209-219.

Cohen, J., Cohen, P., West, S. and Aiken, L., (2013) *Applied multiple regression/correlation analysis for the behavioral sciences,* Routledge: London.

Coyle, J.J., Novack, R.A., Gibson, B.J. and Langley, C.J. (2021) *Supply chain management: a logistics perspective*. Boston Massachusetts: Cengage Learning.

Collis, J. and Hussey, R. (2021) *Business research: A practical guide for students* 5th edn., Macmillan Education Limited: London.

CSCMP (2023) Council of Supply Chain Management Professionals. Available at: https://cscmp.org/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx?hkey=60879588-f65f-4ab5-8c4b-6878815ef921 [Accessed 26 November 2023]

Cuthill, M. (2002) Exploratory research: citizen participation, local government and sustainable development in Australia, *Sustainable development*, 10(2), pp. 79-89.

Christopher, M., (2022) *Logistics and supply chain management*. London: Pearson

Cho JJ, Ozment J, and Sink H. (2008). Logistics capability, logistics outsourcing and firm performance in an e-commerce market, *International Journal of Physical Distribution and Logistics Management,* 38(5), pp. 336–359.

Cho, D.W., Lee, Y.H., Ahn, S.H. and Hwang, M.K. (2012) A framework for measuring the performance of service supply chain management, *Computers, and Industrial Engineering*, 62(3), pp. 801-818.

Chan, F.T.S. and Qi, H.J. (2003) An innovative performance measurement method for supply chain management, *Supply Chain Management*, 8(3), pp. 209-223. https://doi.org/10.1108/13598540310484618

Chae, B. (2009) Developing key performance indicators for supply chain: an industry perspective, *Supply Chain Management*, 14(6), pp. 422-428. https://doi.org/10.1108/13598540910995192

Chen, Z.X. and Sarker, B.R. (2010) multi-vendor integrated procurement-production system under shared transportation and just-in-time delivery system, *The Journal of the Operational Research Society*, 61(11), pp. 1654-1666.

Chen, Z.S., Zhang, X., Govindan, K., Wang, X.J. and Chin, K.S. (2021) Third-party reverse logistics provider selection: A computational semantic analysis-based multi-perspective multi-attribute decision-making approach, *Expert Systems with Applications*, *166*, p.114051.

Coase, R. (1937) The nature of the firm, *Economica*, 4(1) pp. 386 – 405

Coase, R. (1960) The problem of social cost, *Journal of Law and Economics*, 3(1) pp. 1-44.

Coltman, T.R., Devinney, T.M. and Keating, B.W. (2011) Best–worst scaling approach to predict customer choice for 3PL services, *Journal of Business Logistics*, 32(2), pp. 139-152.

Creseada (2024) Available at: https://www.creseada.com/ [Accessed 30 July 2024]

Chu, Z., Wang, L. and Lai, F. (2019) Customer pressure and green innovations at third party logistics providers in China: The moderation effect of organizational culture. *International Journal of Logistics Management*, 30(1), pp. 57-75.

Cureau, A. (2016) *The use of logistics service providers (LSP) to gain a competitive advantage-A case study*. St. Louis: Webster University

Cuypers, I.R., Hennart, J.F., Silverman, B.S. and Ertug, G. (2021) Transaction cost theory: Past progress, current challenges, and suggestions for the future. *Academy of Management Annals*, *15*(1), pp. 111-150.

Cuthbertson, R. and Piotrowicz, W. (2011) Performance measurement systems in supply chains: A framework for contextual analysis, *International Journal of Productivity and Performance Management*, 60(6), pp. 583-602.

Dahlman, C. (1979) The problem of externality, *The journal of law and economics*, 22(1), pp. 141-162.

Dabhilkar, M. (2011) Trade-offs in make-buy decisions, *Journal of Purchasing and Supply Management*, 17(3), pp. 158-166.

Damen, J. (2001) Service-controlled agile logistics, *Logistics Information Management*, 14(3), pp. 185-195.

Darko, E.O. and Vlachos, I. (2022) Creating valuable relationships with third-party logistics (3PL) providers: A multiple-case study, *Logistics*, *6*(2), p.38.

Dapiran, P., Lieb, R., Millen, R. and Sohal, A. (1996) Third party logistics services usage by large Australian firms*, International Journal of Physical Distribution & Logistics Management*, 26(10), pp. 36-45. https://doi.org/10.1108/09600039610150442

Denscombe, M. (2008) Communities of practice a research paradigm for the mixed methods approach, *Journal of Mixed Methods Research*, 2(3), pp. 270-283.

Diem Le, T., T., Chromjaková, F., and Quang, D., V. (2023) Transformation into 4PL: The case of local logistics service providers in Vietnam, *Journal of Eastern European and Central Asian Research,* 10(2), pp. 311-325.

Doratiotto, K., Vidal Vieira, J.G., da Silva, L.E. and Fávero, L.P. (2023) Evaluating logistics outsourcing: a survey conducted with Brazilian industries, *Benchmarking: An International Journal*, *30*(3), pp. 788-810.

Dong, Y. (1998) Just-in-time purchasing and supply: A supply chain analysis, University of Maryland, College Park.

DHL (2024) Available at: https://www.dhl.com/ng-en/home/about-us.html [Accessed 30 July 2024]

Dissanayake, C.K. (2015) Fuzzy Logic Applications in Supply Chain Performance Measurement. Huntsville: American Society for Engineering Management (ASEM).

Dobrzykowski, D.D., Tran, O. and Tarafdar, M. (2010) Value co-creation and resource-based perspectives for strategic sourcing, *Strategic Outsourcing: an International Journal*, 3(2), pp. 106-127.

Ecer, F. (2018) Third-party logistics (3PLs) provider selection via Fuzzy AHP and EDAS integrated model, *Technological and Economic Development of Economy*, 24(2), pp. 615-634.

Ejem, E.A., Uka, C.M., Dike, D.N., Ikeogu, C.C., Igboanusi, C.C. and Chukwu, O.E. (2021). Evaluation and selection of Nigerian third-party logistics service providers using multi-criteria decision models. *LOGI–Scientific Journal on Transport and Logistics*, *12*(1), pp.135-146.

Emerson, R.W., (2015) Convenience sampling, random sampling, and snowball sampling: How does sampling affect the validity of research? *Journal of visual impairment & blindness*, *109*(2), pp. 164-168.

Eldemire, F., (2016) Third party logistics (3PL) provider selection with AHP application, *Procedia-Social and Behavioral Sciences*, 235(0), pp. 226-234.

Elgazzar, S., Tipi, N. and Jones, G. (2019) Key characteristics for designing a supply chain performance measurement system. *International Journal of Productivity and Performance Management,* 69(2), pp. 296-318.

El-Baz, A.M. (2011) Fuzzy performance measurement of a supply chain in manufacturing companies, *Expert Systems Applications*, 38(6), pp. 6681-6688. DOI: http://10.1016/j.eswa.2010.11.067

El Baz, J. and Laguir, I. (2017) Third-party logistics providers (TPLs) and environmental sustainability practices in developing countries: the case of Morocco, *International Journal of Operations & Production Management*, 37(10), pp. 1451-1474.

Evangelista, P. and Durst, S. (2015) Knowledge management in environmental sustainability practices of third-party logistics service providers: *Very Informal Newsletter on Library Automation. Vine*, 45(4), pp. 509-529.

Etokudoh, E., Boolaky, M. and Gungaphul, M. (2017) Third-party logistics outsourcing: An exploratory study of the oil and gas industry in Nigeria, *Sage Open*, 7(4), p.2158244017735566.

Eydi, A. and Rastgar, S. (2022) A DEA model with dual-role factors and fuzzy data for selecting third-party reverse logistics provider, case study: Hospital waste collection, *Ain Shams Engineering Journal*, 13(2), pp. 1-25.

Esra, Y. and Ayşegül, I. (2016) Integration of DEMATEL, ANP and DEA methods for third party logistics providers' selection, *Management Science Letters*, 6(1), pp. 325-340. 10.5267/j.msl.2016.3.004

Ewuzie, C., Ugwuonah, G., Okolo, V., Okocha, E. and Agu, A.O. (2023) Stimulators of third-party logistics performance of supply chains in the Nigerian manufacturing industry, *Management*, *21*(3), pp. 176-188.

Ezenwa, A., Whiteing, A., Johnson, D. and Oledinma, A., (2018) Investigating ICT diffusion dynamics among SMEs third-party logistics providers in Nigeria: an exploratory mixed-method study. *In Proceedings of the 2018 LRN Conference*, CILT.

Ezenwa, A., Whiteing, A., Johnson, D., Oledinma, A. and Ejem, E.A., (2021) Development of strategies to improve information communication technology diffusion in Nigeria's logistics and transport industry: adaptation of structure-process-outcome model, *International Journal of Integrated Supply Management*, 14(4), pp. 363-391.

Ezenwa, A., Whiteing, A., Johnson, D. and Oledinma, A. (2020). Factors influencing information and communication technology diffusion in Nigeria's transport logistics industry: an exploratory study. *International Journal of Integrated Supply Management*, *13*(2-3), pp.252-276.

Fang, S.R., Chang, Y.S. and Peng, Y.C. (2011) Dark side of relationships: A tensions-based view, *Industrial Marketing Management*, 40(5), pp. 774-784.

Fang, L.C., Shen, J. and McBride, A. (2005) Outsourcing HR as a Competitive Strategy? A Literature Review and an Assessment of Implications, *Human resource management*, 44(4), pp. 413-432.

Fassetta, A. (2020) *Implementing cross-docking facilities within a third-party logistics provider*, University of Johannesburg (South Africa).

Fatma and Mahjoub (2013) Logistics Outsourcing Relationships: Conceptual Model, *International Journal of Economics Finance and Management Sciences*, 1(2), pp. 81-88.

Fazel, M.H., Khorshidian, H. and Akbarpour S. M. (2016) A constraint programming model for the scheduling of JIT cross-docking systems with pre-emption, *Journal of Intelligent Manufacturing*, 27(2), pp. 297-313.

Farsijani, H., Fard, Y.S., Kharazian, M.A. and Nikabadi, M.S., (2012) A Method for Identifying Critical Success Factors of JIT Implementation in Different Circumstances, *Journal of Supply Chain Management Systems*, 1(1), pp. 1-9.

Felea, M. and Albastroiu, I. (2013) Defining the Concept of Supply Chain Management and Its Relevance to Romanian Academics and Practitioners, *Amfiteatru Economic*, 15(33), pp. 74-88.

Felea, M. and Albastroiu, I. (2012) Supply Chain Strategies, *Valahian Journal of Economic Studies*, 3(3), pp. 45-52.

Ferguson, K.L. (2006) Human resource management systems and firm performance, University of Louisville.

Fischhoff, B. (2015) The realities of risk-cost-benefit analysis. *Science*, *350*(6260), p.aaa6516.

Fredriksson, A., Janne, M. and Rudberg, M. (2021) Characterizing third-party logistics setups in the context of construction, *International Journal of Physical Distribution & Logistics Management,* **51**(4), pp. 325-349.

Froio, P.J. and Bezerra, B.S. (2021) Environmental sustainability initiatives adopted by logistics service providers in a developing country–an overview in the Brazilian context, *Journal of Cleaner Production*, *304*(126989), pp. 1-9.

Gadde, L.E. and Hulthén, K. (2009) Improving logistics outsourcing through increasing buyer–provider interaction, *Industrial Marketing Management*, 38(6), pp. 633-640.

Gabriel, D.H. and Parthiban, M. (2020) A Literature Review on Global Challenges for Third Party Logistics (TPL or 3PL), *Asian Review of Mechanical Engineering*, *9*(2), pp. 27-30.

Garg, D., Kaul, O. and Deshmukh, S. (1998) JIT implementation: A case study, *Production, and Inventory Management Journal,* 39(3), pp. 26-31.

Gardner, J.T. and Cooper, M.C. (2003) Strategic Supply Chain Mapping Approaches, *Journal of Business Logistics*, 24(2), pp. 37-64.

Ghauri, P. and Gronhaug, K. (2005) *Research methods in business studies: A practical guide*, 3rd edn., Pearson Education Limited, Essex.

Global Data Plc (2022) Global Data Company Profiles and Strategic SWOT analysis Review: Wincanton Plc (WIN), *Global Data Plc* pp. 1-41.

Goldkuhl, G. (2012) Pragmatism vs interpretivism in qualitative information systems research, *European Journal of Information Systems, Supply Special Issue: Qualitative Research Methods,* 21(2), pp. 135-146.

Gotzamani, k., Longinidis, P. and Vouzas, F (2010) The logistics services outsourcing dilemma: quality management and financial performance perspectives, *Supply Chain Management: An International Journal*, 15(6), pp. 438-453. https://doi.org/10.1108/13598541011080428

Gorman, K. and Macintosh, R. (2014) *Research methods for business and management: A guide to writing your dissertation*, Goodfellow Publishers Limited, Oxford.

Gorane, S.J. and Kant, R. (2016) Supply chain practices: An implementation status in Indian manufacturing organizations, *Benchmarking: An International Journal*, 23(5), pp. 1076-1110.

Ghijsen, P., Semeijn, J. and Wang, A. (2009) Modern 3PL Services in China: The Role of Trust, *Journal of International Business and Economy*, 10(2), pp. 103-135.

Gilligan, E. (2004) Lean logistics: Not a fad diet, *Journal of Commerce*, 5(3), pp. 1-20.

Govindan, K., Mangla, S.K. and Luthra, S. (2017) Prioritising indicators in improving supply chain performance using fuzzy AHP: insights from the case example of four Indian manufacturing companies, *Production Planning & Control*, *28*(6-8), pp. 552-573.

Govindan, K., Khodaverdi, R. and Vafadarnikjoo, A. (2015) Intuitionistic fuzzy based DEMATEL method for developing green practices and performances in a green supply chain, *Expert Systems with Applications*, 42(20), pp. 7207-7220.

Gunasekaran, A., Patel, C. and Tirtiroglu, E. (2001) Performance measures and metrics in a supply chain environment, *International Journal of Operations & Production Management*, 21(1/2), pp. 71-87. https://doi.org/10.1108/01443570110358468

Gopal, P. and Thakkar, J. (2012) A review on supply chain performance measures and metrics: 2000-2011, *International Journal of Productivity and Performance Management*, 61(5), pp. 518-547. https://doi.org/10.1108/17410401211232957

Gotzamani, K., Longinidis, P. and Vouzas, F. (2010) The logistics services outsourcing dilemma: quality management and financial performance perspectives, *Supply Chain Management: An International Journal*, 15(6), pp. 438-453.

Govindan, K., Khodaverdi, R. and Vafadarnikjoo, A. (2016) A grey DEMATEL approach to develop third-party logistics provider selection criteria, *Industrial Management & Data Systems,* 116(4), pp. 690-722.

Green, K.W., Whitten, D. and Inman, R.A. (2008). The impact of logistics performance on organizational performance in a supply chain context, *Supply chain management: An International journal*, *13*(4), pp. 317-327.

Gupta, A., Singh, R.K. and Mangla, S.K. (2022) Evaluation of logistics providers for sustainable service quality: Analytics based decision making framework, *Annals of Operations Research,* 315(2), pp. 1617-1664.Harvey, M. (2000) Innovation and competition in UK supermarkets, *Supply Chain Management*, 5(1), pp. 15-21. https://doi.org/10.1108/13598540010294892

Hatami-Marbini, A., Asu, J.O., Hafeez, K. and Khoshnevis, P. (2024). DEA-Driven Risk Management Framework for Optimising Supply Chain Strategies in the Nigerian Oil Industry. *Socio-Economic Planning Sciences*, p.101996.

Harris, C.M. (2009) Strategic human resource management at the crossroads: Relationships among human resource capital, overlapping tenure, behaviours, and performance, The University of Texas at Arlington.

Halldórsson, A. and Skjøtt-Larsen, T. (2004) Developing logistics competencies through third party logistics relationships, *International Journal of Operations & Production Management*, 24(1/2), pp. 192-206.

Halim, H.A., Ahmad, N.H. and Ramayah, T. (2012). Probing into the issues of outsourcing among SMEs in Malaysia. In *2012 International Conference on Statistics in Science, Business and Engineering (ICSSBE)* (pp. 1-6). IEEE.

Hsiao, H.I., Kemp, R.G.M., Van der Vorst, J.G.A.J. and Omta, S.O. (2010). A classification of logistic outsourcing levels and their impact on service performance: Evidence from the food processing industry, *International journal of production economics*, *124*(1), pp. 75-86.

Hausman, W.H., Lee, T., and Neale, J. (2004) Supply Chain Performance Metrics, in: The Practice of Supply Chain Management: Where Theory and Application Converge. International Series in Operations Research & Management Science, Vol. 62, Boston, MA: Springer.

Hauser, K. (2002) Simulation and optimization of a cross-docking operation in a just -in -time environment, University of Kentucky.

Heaver, T. and Chow, G. (1999) Logistics strategies for North America in *Global Logistics and Distribution Planning: Strategies for Management*, (3rd ed.), p.413, Kogan Page Publishers: London.

Hilletofth and Hilmola (2010) Role of logistics outsourcing on supply chain strategy and management: Survey findings from Northern Europe, *Strategic Outsourcing: An International Journal,* 3(1), pp. 46-61.

Hingley, M., Lindgreen, A., Grant, D.B. and Kane, C. (2011) Using fourth-party logistics management to improve horizontal collaboration among grocery retailers, *Supply Chain Management,* **16**(5), pp. 316-327.

Haldar, A., Qamaruddin, U., Raut, R., Kamble, S., Kharat, M. and Kamble, S. (2017) 3PL evaluation and selection using integrated analytical modelling, *Journal of Modelling in Management*, 12(2), pp. 224-242. https://doi.org/10.1108/JM2-04-2015-0016

Horsefall, O., Ukpong, L. and Joseph, M. (2018) Comparative study of logistics outsourcing and in-house services on customer satisfaction among Nigerian manufacturing companies, *African-British Journals* 1(1), pp. 49-69.

Hines, P., Holweg, M. and Rich, N. (2004) Learning to evolve: A review of contemporary lean thinking, *International Journal of Operations & amp; Production Management*, 24(10) pp. 994-1011. http://dx.doi.org/10.1108/01443570410558049 [Accessed 23 May 2020]

Holter, A., Grant, D., Ritchie, J. and Shaw, N. (2008) A framework for purchasing transport services in small and medium size enterprises, *International Journal of Physical Distribution & Logistics Management*, 38(1), pp. 21-38, https://doi.org/10.1108/09600030810857193

Hofenk, D., Schipper, R., Semeijn, J. and Gelderman, C. (2011) The influence of contractual and relational factors on the effectiveness of third-party logistics relationships, *Journal of Purchasing and Supply Management*, 17(3), pp. 167-175.

Hojnik, B. (2010) Correlation between Reasons and Effects of Outsourcing: Evidence from Slovenian SME's, *Scientific Annals of the 'Alexandru Ioan Cuza' University of Iasi: Economic Sciences Series*, 57(1), pp. 313-324.

Holcomb, T. and Hitt, M. (2007) Toward a model of strategic outsourcing, *Journal of Operations Management*, 25(2), pp. 464.

Hoover's Company Records (2024) GIST LIMITED. *Hoover's Company Records*. [Online] 1 April. Available from: http://www.proquest.com/reports/gist-limited/docview/1860771515/se-2?accountid=7179 [Accessed: 22 May 2024].

Hosie, P, Egan, V, and Li, Y, (2007) Drivers of Fifth Party Logistics (5pl) Service Providers for Supply Chain Management, *School of Management Working Paper Series*: no. 2007-1, Curtin University of Technology, School of Management.

Hosie, P., Sundarakani, B., Tan, A.W. and Koźlak, A. (2012) Determinants of fifth party logistics (5PL): Service providers for supply chain management, *International Journal of Logistics Systems and Management*, *13*(3), pp. 287-316.

Hrušecká, D., Macurova, L., Juřičková, E. and Kozakova, L. (2015) The analysis of the use of outsourcing services in logistics by Czech manufacturing companies, *Journal of competitiveness*, 7(3), pp. 50-61.

Huang, M., Tu, J., Chao, X. and Jin, D. (2019) Quality risk in logistics outsourcing: A fourth party logistics perspective, *European Journal of Operational Research*, *276*(3), pp. 855-879.

Hwang, B.N. and Shen, Y.C. (2015) Decision making for third party logistics supplier selection in semiconductor manufacturing industry: a non-additive fuzzy integral approach, *Mathematical Problems in Engineering*, 2015(918602), pp. 1-12.

Hwang, T. and Kim, S.T. (2019) Balancing in-house and outsourced logistics services: effects on supply chain agility and firm performance, *Service Business*, 13(3), pp. 531-556.

Ibiama, K.A., Kalu, I.E. and Emenike, G.C. (2024) Evaluation of Logistics Outsourcing Strategies in the Oil and Gas Companies in Niger Delta Region, *International Journal of Research Publication and Reviews,* 5(3), pp. 732-739.

Işıklar, G., Alptekin, E. and Büyüközkan, G. (2007) Application of a hybrid intelligent decision support model in logistics outsourcing, *Computers & Operations Research,* 34(12), pp. 3701-3714.

Jayaram, J. and Tan, K.C. (2010) Supply chain integration with third-party logistics providers, *International Journal of Production Economics*, 125(2), pp. 262-271.

Jain, V., Phogat, S., Ajmera, P. and Sirvi, A., (2022) Modeling the Barriers of Indian Healthcare Supply Chain Management Using ISM, *International Journal of Supply and Operations Management,* 9(3), pp. 321-337.

Janne, M. and Rudberg, M., (2022) Effects of employing third-party logistics arrangements in construction projects, *Production planning & control*, *33*(1), pp. 71-83.

Johnsen, R.E. and Lacoste, S., (2016) An exploration of the 'dark side' associations of conflict, power, and dependence in customer–supplier relationships, *Industrial Marketing Management*, 59(11), pp. 76-95.

Jones, E. and Rashid, M. (2020) Fourth Party Logistics-Enlarging 3PL a Step Further, *International Supply Chain Technology Journal*, *6*(04).

Jones, D., Hines, P. and Rich, N. (1997) Lean logistics, *International Journal of Physical Distribution & Logistics Management*, 27(3-4), pp. 153 – 173. http://dx.doi.org/10.1108/09600039710170557

Johnson, R. and Onwuegbuzie, A. (2004) Mixed methods research: a research paradigm whose time has come, *Educational Researcher*, 33(7), pp. 14-26.

Jovčić, S., Průša, P., Dobrodolac, M. and Švadlenka, L. (2019) A proposal for a decision-making tool in third-party logistics (3PL) provider selection based on multi-criteria analysis and the fuzzy approach, *Sustainability*, *11*(15), 4236 (pp. 1-24).

Janvier-James, A.M., (2012) A new introduction to supply chains and supply chain management: Definitions and theories perspective, *International Business Research*, *5*(1), pp.194-207.

Judith, S., and Johnson, B. (2017) How to Construct a Mixed Methods Research Design, *Kölner Zeitschrift Für Soziologie Und Sozialpsychologie,* 69(2), pp. 107-31.

Jüttner, U. (2005) Supply chain risk management: Understanding the business requirements from a practitioner perspective, *The International Journal of Logistics Management*, 16(1), pp. 120-141. DOI: https://doi.org/10.1108/09574090510617385

Jung, H. (2017) Evaluation of third-party logistics providers considering social sustainability, *Sustainability*, 9(5), pp.777-795.

Ikediashi, D.I., Ogunlana, S.O., Boateng, P. and Okwuashi, O. (2012) Analysis of risks associated with facilities management outsourcing: a multivariate approach. *Journal of Facilities Management*, *10*(4), pp. 301-316.

Karbassi Yazdi, A., Hanne, T., Osorio Gómez, J.C. and García Alcaraz, J.L. (2018) Finding the best third-party logistics in the automobile industry: A hybrid approach, *Mathematical Problems in Engineering*, 2018(5251261), pp. 1-19.

Kariko, S.G. (2012) Logistics outsourcing and supply chain performance: a survey of universities in Nairobi County (Doctoral dissertation, University of Nairobi).

Kalemci, R. (2013) Discussing the Role of Trust in Behavioural Assumptions of Transaction Cost Theory, *Turkish Journal of Business Ethics November*, 6(2), pp. 72-83.

Kalinzi, C. (2016) Outsourcing (Logistics) Services and Supply Chain Efficiency-A Critical Review of Outsourcing Function in Mukwano Group of Companies, *Journal of Outsourcing and Organizational Information Management,* 16(16), pp. 1-22.

Ketokivi, M. and Mahoney, J.T. (2020) Transaction cost economics as a theory of supply chain efficiency, *Production and Operations Management*, *29*(4), pp. 1011-1031.

König, A. and Spinler, S. (2016) The effect of logistics outsourcing on the supply chain vulnerability of shippers: Development of a conceptual risk management framework, *The International Journal of Logistics Management*, 27(1), pp. 122-141, https://doi.org/10.1108/

Karrapan, C., Sishange, M., Swanepoel, E. and Kilbourn, P.J. (2017) Benchmarking criteria for evaluating third-party logistics providers in South Africa, *Journal of Transport and Supply Chain Management*, 11(1), pp. 1-10.

Kavčič, K., Suklan, J. and Milost, F. (2016) Outsourcing Logistics Activities: Evidence from Slovenia, *Promet-Traffic &Transportation*, 28(6), pp. 575-581.

Kumar, C.G. and Nambirajan, T. (2013) Supply chain management components, supply chain performance and organizational performance: A critical review and development of conceptual model, *International Journal on Global Business Management & Research*, *2*(1), pp. 86-96.

Keller, A.Z. and Kazazi, A. (1993) ″Just-in-Time″ Manufacturing Systems: A Literature Review, *Industrial Management & Data Systems*, 93(7), pp. 2-32.

Kleijnen, J. and Smits, M. (2003) Performance metrics in supply chain management, *Journal of the operational research society,* 54(5), pp. 507-514.

Khalili-Damghani, K., Taghavi, M. and Abtahi, A.R. (2012) A fuzzy two-stage DEA approach for performance measurement: Real case of agility performance in dairy supply chains. *International Journal of Applied Decision Sciences*, 5(4), pp. 293-317. DOI: 10.1504/IJADS.2012.050019.

Knemeyer, M. and Murphy, P. (2004) Evaluating the Performance of Third-Party Logistics Arrangements: A Relationship Marketing Perspective, *Journal of Supply Chain Management,* 40(1), pp. 35-51.

Kobo360 (2024) Available at: https://www.kobo360.com/ [Accessed 30 July 2024].

König, A. and Spinler, S. (2016) The effect of logistics outsourcing on the supply chain vulnerability of shippers: Development of a conceptual risk management framework, *The International Journal of Logistics Management*, 27(1), pp. 122-141, https://doi.org/10.1108/

Lambert, D.M., Cooper, M.C. and Pagh, J.D. (1998) Supply chain management: implementation issues and research opportunities, *The international journal of logistics management*, *9*(2), pp. 1-20.

Lahiri, S., Karna, A., Kalubandi, S.C. and Edacherian, S. (2022). Performance implications of outsourcing: A meta-analysis. *Journal of Business Research*, *139*, pp.1303-1316.

Lai, F., Chu, Z., Wang, Q. and Fan, C. (2013) Managing dependence in logistics outsourcing relationships: evidence from China *International Journal of Production Research*, 51(10), pp. 3037-3054.

Le, P.L., Jarroudi, I., Dao, T.M. and Chaabane, A. (2021) Integrated construction supply chain: an optimal decision-making model with third-party logistics partnership. *Construction management and economics*, *39*(2), pp. 133-155.

Leuschner, R., Carter, C.R., Goldsby, T.J. and Rogers, Z.S. (2014) Third-party logistics: a meta-analytic review and investigation of its impact on performance, *Journal of Supply Chain Management*, 50(1), pp. 21-43.

Li, F., Li, L., Jin, C., Wang, R., Wang, H. and Yang, L. (2012) A 3PL supplier selection model based on fuzzy sets, *Computers & Operations Research*, 39(8), pp. 1879-1884.

Lieb, K.J. and Lieb, R.C. (2010) Environmental sustainability in the third-party logistics (3PL) industry. *International Journal of Physical Distribution & Logistics Management*, 40(7), pp. 524-533.

Liberto, D. (2015) Wincanton delivers customer satisfaction: Investors Chronicle. *Financial Times.* 5 June 2015. Available from: https://www.proquest.com/trade-journals/wincanton-delivers-customers-satisfaction/docview/1687963964/se-2?accountid=7179 [Accessed 22 May, 2024]

Li-Jun, F., Li, L., Jin, C., Wang, R., Wang, H. and Yang, L. (2012) A 3PL supplier selection model based on fuzzy-sets, *Computers & Operations Research*, 39(8), pp. 1879-1884

Laribi, L. and Dhouib, D. (2015) November. Barriers to implementing reverse logistics in Tunisian companies, in *2015 IEEE International Conference on Service Operations and Logistics, And Informatics (SOLI)* (pp. 145-153), IEEE.

Lieb, R., Millen, A., and Van W. N. (1993) Third Party Logistics Services: A Comparison of Experienced American and European Manufacturers, *International Journal of Physical Distribution & Logistics Management*, 23(6), pp. 35-44.

Lieb, R and Miller, J. (2002) The use of third-party logistics services by large US manufacturers, the 2000 survey, *International Journal of logistics: Research and Applications* 5: pp. 1–12.

Little, A. (1999) An European Supply Chain (SC) survey. [Online] Available at: http://www.adlittle.be/insights/studies/pdf/european_supply_chain_survey.pdf. [Accessed 15 July 2021].

Liu, C.L. and Lyons, A.C. (2011) An analysis of third-party logistics performance and service provision. *Transportation Research Part E: Logistics and Transportation Review,* 47(4), pp.547-570.

Lockamy, A. and McCormack, K. (2004) Linking SCOR planning practices to supply chain performance: An exploratory study, *International Journal of Operations & Production Management*, 24(12), pp. 1192-1218. https://doi.org/10.1108/01443570410569010

Luke, R. and Waugh, B. (2011) Logistics outsourcing by manufacturers in South Africa, *Journal of Transport and Supply Chain Management*, 5(1), pp. 337-360.

Mathauer, M. and Hofmann, E. (2019) Technology adoption by logistics service providers. *International Journal of Physical Distribution & Logistics Management,* **49**(4), pp. 416-434.

Mac-Kingsley, I. and Ihunwo, E., (2018) Logistics Outsourcing and Success of Physical Distribution Management: A Study of Clearing and Forwarding Companies in Rivers State, *World Journal of Entrepreneurial studies*, 2(3), pp.10-21.

Maas, S., Schuster, T. and Hartmann, E. (2018) Stakeholder pressures, environmental practice adoption and economic performance in the German third-party logistics industry—a contingency perspective, *Journal of Business Economics*, 88(2), pp. 167-201.

Mishan, E.J. and Quah, E., (2020) Cost-benefit analysis. Abingdon-on-Thames: Routledge.

Marchet, G., Melacini, M., Sassi, C. and Tappia, E. (2017) Assessing efficiency and innovation in the 3PL industry: an empirical analysis, *International Journal of Logistics Research and Applications*, 20(1), pp. 53-72

Michael, B. and Michael, R. (2011) A transaction cost economics view of outsourcing, *International Journal of Business, Humanities & Technology*, 1(2), pp. 34-43.

Mageto, J., Prinsloo, G. and Luke, R. (2018) The extent of logistics outsourcing among small and medium-sized manufacturing enterprises in Nairobi, *Journal of Transport and Supply Chain Management*, 12(1), pp. 1-9.

Mageto, J., Prinsloo, G. and Luke, R. (2020) Determinants of logistics outsourcing performance among small and medium enterprises. *International Journal of Logistics Systems and Management*, *35*(4), pp. 541-565.

Mageto, J. (2022). Current and future trends of information technology and sustainability in logistics outsourcing, *Sustainability*, *14*(13), p.7641.

Maersk (2024) Shipping to and from Nigeria. Available at: https://www.maersk.com/local-information/imea/nigeria [Accessed 30 July 2024].

Malakoti-Negad, M. (2016) Strategies for Small and Medium-Sized Enterprises to Engage Third-Party Logistics Providers, College of Management and Technology, Walden University.

Maltz, A.B. and Ellram, L.M. (1997) Total cost of relationship: an analytical framework for the logistics outsourcing decision, *Journal of Business Logistics*, 18(1), pp. 45-

Manchester, P. (2001) Business enters the fourth dimension: fourth-party logistics, contracting a third party to perform certain business functions is now widespread, but fourth-party outsourcing: [Surveys edition]. *Financial Times*, 04. ISSN 03071766.

Martichenko, R., (2007) Moving into the House of Lean, *Logistics Management (2002*), 46(4), pp. 32-35.

Mayson, S. and Barrett, R. (2006) The 'science' and 'practice' of HRM in small firms, *Human Resource Management Review*, 16(4), pp. 447-455.

Mazzanti, M., Montresor, S. and Pini, P. (2009) What Drives (or Hampers) Outsourcing? Evidence for a Local Production System in Emilia Romagna, *Industry, and Innovation*, 16(3), pp. 331-365.

Marchet, G., Melacini, M., Perotti, S. and Sassi, C. (2018). Types of logistics outsourcing and related impact on the 3PL buying process: empirical evidence, *International Journal of Logistics Systems and Management*, *30*(2), pp. 139-161.

Mentzer, J., Witt, W., Keebler, J., Min, S., Nix, N., Smith, D. and Zacharia, Z. (2001) Defining Supply Chain management, *Journal of Business Logistics*, 22(2), pp. 1-25 http://dx.doi.org/10.1002/j.2158-1592.2001.tb00001.x

Mitchell, A. and Education, A.E. (2018) July. A review of mixed methods, pragmatism, and abduction techniques, In *Proceedings of the European Conference on Research Methods for Business & Management Studies* (pp. 269-277).

Mordor Intelligence (2023) Mordor Intelligence. Available at: https://www.mordorintelligence.com/industry-reports/nigeria-3pl-market [Accessed 25 November 2023]

Mordor Intelligence (2023) Modor Intelligence. Available at: https://www.mordorintelligence.com/industry-reports/global-3pl-market [Accessed 25 November 2023]

Moharamkhani, A., Bozorgi-Amiri, A. and Mina, H. (2017) Supply chain performance measurement using SCOR model based on interval-valued fuzzy TOPSIS, *International Journal of Logistics Systems and Management*, *27*(1), pp. 115-132.

Moberg, C.R., Whipple, T.W., Cutler, B.D. and Speh, T.W. (2004) Do the management components of supply chain management affect logistics performance? *The International Journal of Logistics Management*, *15*(2), pp.15-30.

MSC (2024) Connecting Nigeria to the World. Available at: https://www.msc.com/en/local-information/africa/nigeria [Accessed 30 July 2024].

McIvor, R. (2009) How the transaction cost and resource-based theories of the firm inform outsourcing evaluation, *Journal of Operations management,* 27(1), pp. 45-63.

Macharia, R., Nzulwa, J. and Kwena, R. (2017) Influence of Logistics Outsourcing on Project Performance in the Oil and Gas Industry in Kenya, *Strategic Journals*, 4(2), pp. 266-278.

Meade, L. and Sarkis, J. (2002) A conceptual model for selecting and evaluating third-party reverse logistics providers, Supply Chain Management: An International Journal, 7(5), pp. 283-295.

Mello, J.E., Stank, T.P. and Esper, T.L. (2008) A model of logistics outsourcing strategy, *Transportation Journal*, pp. 5-25.

Mello, J.E. (2006) An Investigation into the Nature of the Relationship of Corporate Culture to Logistics Outsourcing Decisions, The University of Tennessee, Knoxville.

Menon, M.K., McGinnis, M.A., and Ackerman, K.B. (1998) Selection criteria for providers of third-party logistics services: an exploratory study, *Journal of business logistics*, 19(1), pp. 121-137.

Marchesini, P. and Alcântara C., (2016) Logistics activities in Supply Chain Business Process: A conceptual framework to guide their implementation. *The International Journal of Logistics Management,* 27(1), pp. 6-30.

Michael, B. and Michael, R. (2011) A transaction cost economics view of outsourcing, *International Journal of Business, Humanities & Technology*, 1(2), pp. 34-43.

Min, H., (2013) Examining logistics outsourcing practices in the United States: from the perspectives of third-party logistics service users, *Logistics Research*, 6(4), pp. 133-144.

Miyashita, K. (2015) Japanese Forwarders' Local Import Hub in Asia: 3PL Power and Environmental Improvement, *The Asian Journal of Shipping and Logistics*, 31(3), pp. 405-427.

Murphy, P.R., and Poist, R.F. (1998) Third-party logistics usage: an assessment of propositions based on previous research, *Transportation Journal*, 37(4), pp. 26-35.

Muslimin, H., Suryadi H. and Ardiansyah, C. (2015) The relationship Between Logistics and Financial Performance of SMEs in Indonesia, *I J A B E R*, 13(7), pp. 4805-4814

Myerson, P. (2013) Lean Supply Chain Strategies: The Case for Outsourcing with Third (and Fourth) Party Logistics Providers, *Industry Week*, 13(12), pp. 1-3.

Narkhede, B.E., Raut, R., Gardas, B., Luong, H.T. and Jha, M. (2017) Selection and evaluation of third-party logistics service provider (3PLSP) by using an interpretive ranking process (IRP), *Benchmarking: An International Journal*, 24(6), pp. 1597-1648.

Ndu, O. and Ike-Elechi, O. (2014). Third-party logistics service marketing and economic development (Study of the speed mail businesses in Nigeria), *Management and Organizational Studies*, 1(1), pp.32-51.

Núñez-Carballosa, A. and Guitart-Tarrés, L. (2011) Third-party logistics providers in Spain, *Industrial management & data systems*, 111(8), pp. 1156-1172.

Narasimharajan, M. and Venkatesan, R. (2022) Factors Influencing Decision-making Models for the Estimation of Competitive Effectiveness Among Third-party Logistics Providers, *South African Journal of Industrial Engineering,* 33(2), pp. 128-142.

Nel, J., De Goede, E. and Niemann, W. (2018) Supply chain disruptions: Insights from South African third-party logistics service providers and clients, *Journal of Transport and Supply Chain Management*, 12(1), pp. 1-12.

Nurain, S.A. and Adesunkanmi, S.O. (2022) The Extent of Logistics Outsourcing Practices among Manufacturing Companies in Southwestern Nigeria, *East African Journal of Arts and Social Sciences*, *5*(2), pp.192-206.

Olugu, E. and Wong, K. (2012) An expert fuzzy rule-based system for closed-loop supply chain performance assessment in the automotive industry, *Expert Systems Applications*, 39(1), 375-384. DOI: 10.1016/j.eswa.2011.07.026.

Olubiyo, O.C. (2022). *Investigating the impact of third-party logistics outsourcing on the performance of clothing manufacturing SMES in Nigeria.* PhD Thesis. University of Johannesburg. Available at http://www.ujcontent.uj.ac.za (Accessed: 14 May 2024).

Ordanini, A. and Silvestri, G. (2008) Recruitment and selection services: Efficiency and competitive reasons in the outsourcing of HR practices, *The International Journal of Human Resource Management,* 19(2), pp. 372-391.

Okoroafor, S. and Nwankwo, S. (2021) The Challenges of Third-party Logistics in Nigerian Pharmaceutical Industry, *International Journal of Academic Management Science Research* (IJAMSR), 5(2), pp. 12-18.

Onyebueke, V., Ifeanacho, M. and Wordu, S. (2017) Overcoming the Challenges of Logistics Outsourcing in Selected Oil and Gas Companies in Rivers State Nigeria, *International Journal in Management & Social Science*, *5*(12), pp. 27-45.

Özcan, E. and Ahıskalı, M., (2020) 3PL service provider selection with a goal programming model supported with multicriteria decision making approaches, *Gazi University Journal of Science*, *33*(2), pp. 413-427.

Quélin, B. and Motlow, D. (1998) Outsourcing: A transaction cost theory approach, *Réseaux: The French Journal of Communication-Technologie-Société*, 6(1), pp. 75-98.

Oyedijo, A., Francois Koukpaki, A.S., Kusi-Sarpong, S., Alfarsi, F. and Yang, Y., (2022). Restraining forces and drivers of supply chain collaboration: evidence from an emerging market. *Supply Chain Management: An International Journal*, *27*(3), pp.409-430.

Özbek, A. and Eren, T. (2013) Multiple Criteria Decision-Making Methods for Selecting Third Party Logistics Firms: a Literature Review, *Journal of Engineering and Natural Sciences* Sigma, 31, pp. 178-202.

Öztayşi, B. and Surer, O. (2014) Supply chain performance measurement using a SCOR based fuzzy VIKOR approach, *Studies in Fuzziness and Soft Computing*, 313(1), pp. 199-224. DOI: 10.1007/978-3-642-53939-8-9.

Panayides, P. (2006) Enhancing innovation capability through relationship management and implications for performance, *European Journal of Innovation Management*, 9(4), pp. 466-483.

Park, S. (2017) An Investigation of the Antecedents and Impacts of Logistics Management Capabilities and Logistics Outsourcing, State University of New York at Buffalo.

Piplani, R., Pokharel, S., and Tan, A. (2004) Perspectives on the use of information technology at third party logistics service providers in Singapore, *Asia Pacific Journal of Marketing and Logistics*, 16(1), pp. 27-41. https://doi.org/10.1108/13555850410765113

Pongpanich, R., Lee, T.R. and Sinnarong, N., (2015) The key factors for selecting C2C logistics companies in Thailand: an application of analytical hierarchy process and three ranking logic, *International Journal of Logistics Systems and Management*, 21(2), pp. 242-268.

Pfoser, S., Kotzab, H. and Bäumler, I. (2022) Antecedents, mechanisms, and effects of synchromodal freight transport: a conceptual framework from a systematic literature review. *International Journal of Logistics Management,* 33(1), pp. 190-213.

Pienaar, W. (2009) Introduction to Business Logistics, Southern Africa: Oxford University.

Price, M. (2006) A Model for Logistics Management in a Post-Soviet Central Asian Transitional Economy, *Journal of Business Logistics*, 27(2), pp. 301-X.

Premkumar, P., Gopinath, S. and Mateen, A. (2021) Trends in third party logistics–the past, the present & the future, *International Journal of Logistics Research and Applications*, *24*(6), pp. 551-580.

Progressive Digital Media Transportation (2016) TouchPath introduces new third-party logistics solution, Progressive Digital Media Transportation (incl. Airports, Roadways, Railways, Shipping, Automotive & Logistics) News, Oct 18th.

Quélin, B. and Motlow, D. (1998) Outsourcing: A transaction cost theory approach, *Réseaux: The French Journal of Communication-Technologie-Société*, 6(1), pp. 75-98.

Qureshi, M. (2022) A Bibliometric Analysis of Third-Party Logistics Services Providers (3PLSP) Selection for Supply Chain Strategic Advantage, *Sustainability*, 14(11836) pp. 1-25. https://doi.org/10.3390/su141911836

Rahman, S., Ahsan, K., Yang, L. and Odgers, J. (2019) An investigation into critical challenges for multinational third-party logistics providers operating in China, *Journal of Business Research*, *103*, pp. 607-619.

Rajesh, R., Pugazhendhi, S., Ganesh, K., Muralidharan, C. and Sathiamoorthy, R. (2011) Influence of 3PL service offerings on client performance in India, *Transportation Research Part E: Logistics and Transportation Review*, 47(2), pp. 149-165.

Rocha, J. and Lehenbauer, K., (2020) Third Party Logistics and Beyond, In *Proceedings of the 16th International RAIS Conference, March 30-31, 2020* (No. 0017jrk). Research Association for Interdisciplinary Studies.

Ricardo Moreira, D.S., Guilherme, F.F. and Garza-Reyes, J. (2023) Logistics Service Providers and Industry 4.0: A Systematic Literature Review, *Logistics,* **7**(1), pp. 1-26.

Riaz, M. and Farid, H.M.A., (2022) Picture fuzzy aggregation approach with application to third-party logistic provider selection process, *Reports in Mechanical Engineering*, *3*(1), pp. 227-236.

Raut, R., Kharat, M., Kamble, S. and Kumar, C.S. (2018) Sustainable evaluation and selection of potential third-party logistics (3PL) providers, *Benchmarking: An International Journal*, 25(1), pp. 76-97.

Ray, S. (1990) Just-in-Time Purchasing: A Case Study, *Hospital materiel management quarterly*, 12(1), pp. 7-13.

Richey, R.G. and Davis-Sramek, B. (2020) Supply Chain Management and Logistics: An Editorial Approach for a New Era, *Journal of Business Logistics*, *41*(2).

Riaz, M., Farid, H.M.A., Aslam, M., Pamucar, D. and Bozanić, D. (2021) Novel approach for third-party reverse logistic provider selection process under linear Diophantine fuzzy prioritized aggregation operators, *Symmetry*, *13*(7), p.1152.

Rossiter Hofer, A. (2007) Determinants of customer partnering behaviour in logistics outsourcing relationships: A relationship marketing perspective, University of Maryland, College Park.

Roy, J., Pamučar, D. and Kar, S. (2020) Evaluation and selection of third-party logistics provider under sustainability perspectives: an interval valued fuzzy-rough approach, *Annals of Operations Research*, *293*, pp. 669-714.

Rakovska, M., (2016) Characteristics of Logistics Outsourcing in Bulgaria: The Perspectives of the Logistics Service Providers and their Customers, *Logistics & Sustainable Transport*, 7(1), pp. 18-27.

ReportLinker (2020) The global market for Third Party Logistics (3PL) is projected to reach US$1.3 trillion by 2025. Available at: https://www.globenewswire.com/Tracker?data=kv0pOVvK3tu5KLQoitQnQ2_FskB0YP9pMdvNw

ZDuBKCIT8DK6uKkIHJmoyUfNm_KNUfvqH1Nz83qvFZ37sZo5ctIV9GDxrZWFgMEoh0XlzcGKMByM3jSrMaVa9r95j4q1w0y8fmZVfOF-Hea0D6byH8gjpWcYLyYihuoSsdQQ7tgZaurXyAE1vetQW-xUUGm [Accessed 30 May 2024]

Rindfleisch, A. (2020) Transaction cost theory: past, present, and future, *AMS Review*, *10*(1), pp. 85-97.

Samgam, V. and Shee, H.K. (2017) Strategic outsourcing objectives drive 3PL selection criteria in India, *International Journal of Logistics Systems and Management*, 27(1), pp. 20-39.

Sankaran, J., Mun, D. and Charman, Z. (2002) Effective logistics outsourcing in New Zealand, International Journal of Physical Distribution & Logistics Management, 32(8), pp. 682-702.

Selling at the speed of J-I-T, (1998) Discount Store News, 37(22), pp. S12-S14.

Selviaridis, K., Spring, M., Profillidis, V. and Botzoris, G. (2008) Benefits, risks, selection criteria and success factors for third-party logistics services, *Maritime Economics & Logistics*, 10(4), pp. 380-392.

Sakty, K., & Okorie, C. (2021). The Impact of Logistics Outsoaring on the Oil and Gas Industry Performance: A Case Study of the Nigerian Market

Sink, H., Langley, C. and Gibson, B. (1996) Buyer observations of the US third-party logistics market, *International Journal of Physical Distribution & Logistics Management*, 26(3), pp. 38-46. https://doi.org/10.1108/09600039610115009

Somuyiwa Adebambo, O., Odepidan Omolola, M. and Dosunmu Victor, A., (2015) Impact of logistics outsourcing services on company transport cost in selected manufacturing companies in Southwestern Nigeria, *European Journal of Logistics, Purchasing and Supply Chain Management*, *3*(4), pp. 30-41.

Schoonenboom, J. (2019) A performative paradigm for mixed methods research, *Journal of mixed methods research*, *13*(3), pp. 284-300.

Seong-Jong, J., Keebler, J. and Hanks, S. (2013) Measuring the longitudinal performance of 3PL branch operations, *Benchmarking,* 20(2), pp. 251-262.

Shen, T., (2004), Make -to -order: Supply chain structure and inventory strategies, Stanford University.

Saunders, Mark & Lewis, P. & Thornhill, A. (2009) Understanding research philosophies and approaches, Research Methods for Business Students, 4, pp. 106-135.

Sahay, B.S. and Mohan, R. (2006) 3PL practices: an Indian perspective, *International Journal of Physical Distribution & Logistics Management*, 36(9), pp. 666-689.

Shi, Y., Osewe, M., Li, Q., Han, L. and Liu, A. (2019) Global challenges and research gaps for third-party logistics: literature review, *International Journal of Logistics Economics and Globalisation*, *8*(1), pp. 46-66.

Shi, Y., Waseem, R. and Shahid, H.M. (2020) Third-Party Logistics, *Transportation Systems Analysis and Assessment*, p.45.

Shaiq, M. and Hassan, M. (2019) Factors affecting growth of logistics outsourcing: a perspective of third-party logistics providers in Pakistan, *Journal of Business Strategies*, 13(1), pp. 143-152.

Sharfuddin, A.K., Alkhatib, S., Ammar, Z., MD, A.M. and Kumar, A., (2022) Benchmarking the outsourcing factors of third-party logistics services selection: analyzing influential strength and building a sustainable decision model, *Benchmarking,* 29(6), pp. 1797-1825.

Stebbins, R.A. (2001) *Exploratory research in the social sciences* (Vol. 48). New York: SAGE Publishing.

Singh, R.K., Gunasekaran, A. and Kumar, P. (2018) Third party logistics (3PL) selection for cold chain management: a fuzzy AHP and fuzzy TOPSIS approach, *Annals of Operations Research*, 267(1-2), pp. 531-553.

Sink, H.L., and Langley Jr, C.J. (1997) A managerial framework for the acquisition of third-party logistics services, *Journal of business logistics*, 18(2), pp. 163-190.

Sinkovics, R.R., Kuivalainen, O. and Roath, A.S. (2018) Value co-creation in an outsourcing arrangement between manufacturers and third-party logistics providers: resource commitment, innovation and collaboration, *Journal of Business & Industrial Marketing*, 33(4), pp. 563-573.

Slater, G. and Spencer, D. (2000) The uncertain foundations of transaction costs economics, *journal of Economic Issues*, 34(1), pp. 61-87.

Solakivi, T., Töyli, J., Engblom, J. and Ojala, L. (2011) Logistics outsourcing and company performance of SMEs: Evidence from 223 firms operating in Finland, *Strategic Outsourcing: An International Journal*, 4(2), pp. 131-151. https://doi.org/10.1108/17538291111147982

Soh, S. (2010) A decision model for evaluating third-party logistics providers using fuzzy analytic hierarchy process, *African Journal of Business Management,* 4(3), pp. 339-349.

Spillan, J.E., Kara, A. and Heikkinen, H. (2022) An Empirical Assessment of the Bowersox & Daugherty Framework Logistics/Supply Chain Management Strategy in Finland. *The Journal of International Business Research and Practice (JIBRP) Volume 16 July 2022*, p.17.

Statista (2023) Statista. Available at: https://www.statista.com/statistics/254875/third-party-logistics-revenue-size-by-region/#:~:text=The%203PL%20market%20worldwide,gross%20logistics%20revenue%20was%20DHL [Accessed 25 November 2023]

Statista (2023) Statista. Available at: https://www.statista.com/outlook/mmo/third-party-logistics-3pl/worldwide [Accessed 1 February 2023]

Stewart, G. (1995) Supply chain performance benchmarking study reveals keys to supply chain excellence, *Logistics Information Management*, 8(2), pp. 38-44.

Strange, R. (2011) The outsourcing of primary activities: theoretical analysis and propositions, *Journal of Management & Governance*, 15(2), pp. 249-269.

Sudrajat, H.A., Paramartha, D.G.A. and Purba, H.H. (2019) Third-Party Logistics Company Supplier Evaluation using Analytical Hierarchy Process Method: A Case Study in the Manufacturing Industry, *International Journal of Advances in Scientific Research and Engineering*, 5(1), pp. 28-35.

Tajbakhsh, A. and Hassini, E. (2015) A data envelopment analysis approach to evaluate sustainability in supply chain networks, *Journal of Cleaner Production*, 105(), pp. 74-85.

Tanco, M., Jurburg, D., and Escuder, M. (2015) Main difficulties hindering supply chain performance: an exploratory analysis at Uruguayan SMEs, *Supply Chain Management: An International Journal,* 20(1), pp.11-23, https://doi.org/10.1108/SCM-10-2013-0389 [Accessed 01 January 2018]

Tibbetts, T.R., (2015) Logistics clusters, industry segment, and choice of logistics provider sophistication in Mexico, Capella University.

Theeranuphattana, A., Tang, J. and Khang, D. (2012) An Integrated Approach to Measuring Supply Chain Performance, *Industrial Engineering and Management Systems*, 11(1), pp. 54-69. 10.7232/iems.2012.11.1.054.

Tecc.com.au. (2002) [Online] Available at: http://www.tecc.com.au/tecc/guide/glossary.asp?letter=S. [Accessed 12 July 2021].

Teo, C.P. (1998) From lean production to lean logistics: A review, *Singapore Management Review*, 20(1), pp. 69-72.

Tornese, F., Unnu, K., Gnoni, M.G. and Pazour, J.A. (2020) On-demand warehousing: main features and business models. *XXV Summer School*.

Tsai, M.C., Lai, K.H., Lloyd, A.E. and Lin, H.J. (2012) The dark side of logistics outsourcing–Unravelling the potential risks leading to failed relationships, *Transportation Research Part E: Logistics and Transportation Review,* 48(1), pp. 178-189.

Tsai, M., Chun-Hua Liao and Chia-Shing Han (2008) Risk perception on logistics outsourcing of retail chains: model development and empirical verification in Taiwan, *Supply Chain Management*, 13(6), pp. 415-424.

Turk, J.I. (2012) The Impact of Stockouts on Customer Loyalty to Lean Retailers, Walden University.

Tyagi, M., Kumar, P. and Kumar, D. (2018) Assessment of CSR based supply chain performance system using an integrated fuzzy AHP-TOPSIS approach. *International Journal of Logistics Research and Applications*, *21*(4), pp. 378-406.

Tyagi, M., Kumar, P. and Kumar, D. (2015) Assessment of critical enablers for flexible supply chain performance measurement system using fuzzy DEMATEL approach, *Global Journal of Flexible Systems Management*, 16(2), pp. 115-132.

Van Doorn, F.M. (2010) Logistics Outsourcing from a Power and Dependence Perspective, School of Management, Open University, Netherlands.

Vaidyanathan, G. (2005) A framework for evaluating third-party logistics, *Communications of the ACM*, 48(1), pp. 89-94.

Vaidyanathan, B.S., Matson, J.O., Miller, D.M. and Matson, J.E. (1999) A capacitated vehicle routing problem for just-in-time delivery, *IIE Transactions*, 31(11), pp. 1083-1092.

Venkatesh, V.G., Zhang, A., Deakins, E., Luthra, S. and Mangla, S. (2019) A fuzzy AHP-TOPSIS approach to supply partner selection in continuous aid humanitarian supply chains. *Annals of Operations Research*, *283*, pp. 1517-1550.

Vlachos, I. and Polichronidou, V. (2024) Multi-demand supply chain triads and the role of Third-Party Logistics Providers, *The International Journal of Logistics Management*, *35*(1), pp. 136-157.

Vlachos, I. and Dyra, S.C. (2020) Theorizing coordination, collaboration, and integration in multi-sourcing triads (B3B triads), *Supply Chain Management: An International Journal*, *25*(3), pp. 285-300.

Villani, E. and Greco, L., (2018) The Dark Side of Outsourcing: The Case of Logistics, *Positive and Negative Aspects of Outsourcing*, p. 107.

Vasiliauskas, A.V. and Jakubauskas, G. (2007) Principle and benefits of third-party logistics approach when managing logistics supply chain, *Transport*, *22*(2), pp. 68-72.

Van der Westhuizen, C. and Niemann, W. (2022) Strategic supply chain alignment: The role of third-party logistics service providers during disruption recovery, *Journal of Transport and Supply Chain Management*, 16(1), pp. 738-749.

Vyas, L. (2016) Contract Management from the Perspectives of Bureaucrats and Contractors: A Case Study of Hong Kong, *International Journal of Public Administration*, 39(10), pp. 744-757.

World Market Intelligence News (2015) Gist wins 12-year warehousing and distribution services contract from M&S. *World Market Intelligence News,* May 14th. Available from: https://www.proquest.com/wire-feeds/gist-wins-12-year-warehousing-distribution/docview/1681024856/se-2?accountid=7179 [Accessed 31 October 2020].

Wallace, T. and Tayler, H. (2022). Marks and Spencer buys Gist for £230m. *Commercial Motor*, 234(6006), p.4. [Online]. Available from: https://www.proquest.com/trade-journals/marks-spencer-buys-gist-£230m/docview/2714113744/se-2?accountid=7179 [Accessed 22 May 2024].

Wan, Q., Yang, Y. and Lai, F. (2019) Disentangling the driving factors of logistics outsourcing: a configurational perspective, *Journal of Enterprise Information Management*, 32(6), pp. 964-992.

Wang, X. and Regan, A. (2002) *Risks and prevention measures in logistics outsourcing* (No. UCI-ITS-LI-WP-02-9).

Wang, C.N., Nguyen, N.A.T., Dang, T.T. and Lu, C.M. (2021) A compromised decision-making approach to third-party logistics selection in sustainable supply chain using fuzzy AHP and fuzzy VIKOR methods. *Mathematics*, *9*(8), p. 886.

Wang, J., Sadler, I. and Shee, H. (2017) Managing logistics outsourcing to China: Business problems and solutions for Australian firms, *The Journal of Business Diversity*, 17(2), pp. 10-29.

Weber, R. (2004) The Rhetoric of Positivism Versus Interpretivism: A Personal View 1, *MIS Quarterly,* 28(1), pp. 1-12.

Wen, Z., Liao, H., Kazimieras Zavadskas, E. and Al-Barakati, A. (2019) Selection third-party logistics service providers in supply chain finance by a hesitant fuzzy linguistic combined

compromise solution method, *Economic research-Ekonomska istraživanja,* 32(1), pp. 4033-4058.

Wernerfelt, B. (1984) A resource-based view of the firm, *Strategic management journal*, 5(2), pp. 171-180.

Wernerfelt, B. (1995) The resource-based view of the firm: Ten years after, *Strategic management journal*, 16(3), pp. 171-174.

Wright, M., Forster, G. and Beale, J. (2017) Improving iSC performance through outsourcing–Considerations for using third-party service providers to increase innovation, capacity and efficiency, *Vaccine*, 35(17), pp. 2195-2197.

Williamson, O. (2008) Outsourcing: Transaction cost economics and supply chain management, *Journal of supply chain management*, 44(2), pp. 5-16.

Winqvist, C. (2023) Optimizing supply chain in Ecommerce through fifth party logistics (5PL), *Theseus,* pp. 1-23.

Williamson, O. (1998) Transaction cost economics: How it works; where it is headed, *De Economist,* 146(1) pp. 23 – 58.

World Economics (2023) World Economics. Available at: https://www.worldeconomics.com/National-Statistics/Informal-Economy/United%20Kingdom.aspx [Accessed 13 November 2023]

Wirtz, J. and Ehret, M. (2009) Creative restructuring - how business services drive economic evolution, *European Business Review*, 21(4), pp. 380-394.

Wright, P., McMahan, G. and McWilliams, A. (1994) Human resources as a source of sustained competitive advantage, *International Journal of Human Resource Management*, 5(1), pp. 299–324.

Wronka, A. (2016). Lean Logistics, *Journal of Positive Management*, 7(2), pp. 55-63.

Wu, Y.C. (2003) Lean manufacturing: a perspective of lean suppliers, *International Journal of Operations & Production Management*, 23(11), pp. 1349-1376.

Yeung, K., Zhou, H., Yeung, A.C. and Cheng, T.C.E. (2012) The impact of third-party logistics providers' capabilities on exporters' performance, *International Journal of Production Economics,* 135(2), pp. 741-753.

Yang, J. (2014) Supply chain agility: Securing performance for Chinese manufacturers, *International Journal of Production Economics*, *150(1)*, pp. 104-113.

Ying, J. and Li-Jun, Z., (2012). Study on green supply chain management based on circular economy. *Physics Procedia*, *25(1)*, pp. 1682-1688.

Yang, Y. and Lindsay, V. (2011) Operational effects and firms' responses, *International Journal of Logistics Management*, 22(3), pp. 306-323.

Yu, Y. and Lindsay, V., (2011). Operational effects and firms' responses: Perspectives of New Zealand apparel firms on international outsourcing, *The International Journal of Logistics Management*, *22*(3), pp. 306-323.

Yuan, Y., Xu, Z. and Zhang, Y. (2022) The DEMATEL–COPRAS hybrid method under probabilistic linguistic environment and its application in Third Party Logistics provider selection, *Fuzzy Optimization and Decision Making*, *21*(1), pp. 137-156.

Yuen, S. (2006) Performance measurement and management of third-party logistics: An organizational theory approach, Hong Kong Baptist University (Hong Kong).

Yusof, M.S., Azmi, Z., Mohd Ali, N.A. and Tan, Y.L. (2018) The Influence of Corporate Governance to the Firm Performance in Logistics Industry, *Available at SSRN 3182311*.

Yeung, A. (2006) The Impact of Third-Party Logistics Performance on the Logistics and Export Performance of Users: An Empirical Study, *Maritime Economics & Logistics*, 8(2), pp. 121-139.

Yvonne Feilzer, M. (2010) Doing mixed methods research pragmatically: Implications for the rediscovery of pragmatism as a research paradigm, *Journal of mixed methods research*, *4*(1), pp. 6-16.

Zailani, S., Shaharudin, M.R., Razmi, K. and Iranmanesh, M. (2017) Influential factors and performance of logistics outsourcing practices: an evidence of Malaysian companies, Review of Managerial Science, 11(1), pp. 53-93.

Zhuang, B. (2012) Antecedents and Consequences of Logistics Outsourcing: An Empirical Investigation in China, The Chinese University of Hong Kong (Hong Kong).

Zimmer, K., (2002) Supply chain coordination with uncertain just-in-time delivery, *International Journal of Production Economics*, 77(1), pp. 1-15.

Zylstra, K. (2005) Lean Distribution - Applying Lean Concepts to Distribution and Logistics (Presentation), *IIE Annual Conference Proceedings*, pp. 1-21.

Appendices

Appendix 1: literature review findings

1A: Summary of findings from literature review on logistics outsourcing usage in developing regions and Nigeria related to the research objectives

Category	Findings and countries		Authors
Impact of logistics outsourcing on business performance in selected developing countries	Organizational effectiveness of 3PLs has a positive correlation with its service quality and its relationship management. Relationship management of the 3PL firms in India is positively correlated with its business performance with their supply chain partners. Service performance of 3PLs has a positive correlation with its business performance with its supply chain partners.	Country of research : India	Asthana et al. (2015)
	Logistics outsourcing improved supply chains. Positive correlation between logistics outsourcing (transportation outsourcing) and oil and gas projects. Weak positive correlation between inventory management outsourcing and oil and gas projects. Logistics outsourcing is a strategy that reduces costs and spreads risks among the participants of the contract.	Country of research : Kenya	Kariko (2012) Machari a et al. (2016)

	Service delivery and flexibility has a higher average mean score for organizations who outsource their logistics compared to those that keep them in-house. Service dependability and effectiveness has a higher average mean score for organizations who keep their logistics in-house compared to those who outsource. Marketing mix service blending, high taxes on service providers by the government, limited knowledge of the market by 3PLs and regulatory inadequacies in areas such as contract management have made the third-party logistics firms providing speed mail services for companies in various industries in Nigeria operationally inadequate	Country of research : Nigeria	Horsefall et al. (2018) Elechi (2014)
	The use of 3PL companies gives companies advantage in their inbound and outbound logistics because products reach the market on time and are delivered on time	Country of research : Mexico	Curea (2016)
Supply chain disruptions and the challenges and barriers of practicing third party logistics in selected	Supply chain disruptions among 3PLs and their clients, and other players in the supply chain are mostly intra and inter organizational related. Hence, the disruptions emanate from within and between 3PLs and their clients and usually not from external factors such as infrastructural deficiencies like road congestion from bad roads or port congestion	Country of research : South Africa	Nel et al. (2018

developing regions	Loss of control, resistance to change by stakeholders, cost switching, industrial unrest and loss of company information to competitors	Country of research : Kenya	Kariko (2012)
	80% of roads in Mozambique are unpaved causing delays and disruptions in the supply chains resulting in inefficiency and inadequacy	Country of research : Mozambique	Wright et al. (2017)
	Lack of education about healthcare supply chain, inefficient supply chain implementation in hospitals and the entire healthcare sector, lack of coordination between the public and private sector in healthcare supply chain, lack of implementation of cutting-edge technologies, ineffective human resource coordination and irregular funding to multiple departments and supply chain staffs	Country of research : India	Jain et al. (2022)
Third party logistics selection and decision support framework in selected	Quality of service, short lead time, on time delivery and transport price are the top four key success factors for selecting customer to customer third party logistics providers in Thailand. Price of service, history of company, dissemination of information, customer and business and delivery follows the previous four. Use of AHP for ranking	Country of research : Thailand	Pongpanich et al. (2015)

developing country contexts	Three factors that influence the selection of third-party logistics providers are quality of service, information management and compliance and collaboration. While the top three ranked categories for selecting 3PLs in South Africa are cost of service and price structure, service delivery and relationship with the 3PL firm	Country of research : South Africa	Karrapan et al. (2017)
	Risk mitigation, uncertainty, deficiency of internal resources for a service and developing strategic alliances are the most influential factors in the decision making and selection process of third-party logistics companies. Decision making trial and evaluation laboratory (DEMATEL) was employed	Country of research : UAE	Sharfuddin et al. (2022)
	Analyzing the present cost of carrying out the proposed logistics function to outsource, visiting 3PL providers' locations and doing adequate due diligence were ranked by the Delphi study to be among the top three factors influencing the selection of third-party logistics firms. Also, factor analysis showed that Internal preparedness and Proactive and authentication initiatives are among the main factors influencing the selection process.	Country of research : Nigeria	Aigbavboa and Mbohwa (2019)
	AHP was used to rank the criteria. Managers attach more importance to time saving when choosing a 3PL. Correlation between time saving, cost saving	Country of	Narasimharajan, M. and

	and competitive edge. AHP, Structural Equation Modeling (SEM) and the supply chain SCOR model indicate that inventory management, transportation and delivery, and quality parts are the three top ranked decision-making aspects hence the main contributors to the decision-making process. Other important decision-making aspects ranked fourth, fifth and sixth using AHP, SEM and the supply chain model are budgeting, projecting planning and vendor selection. Time and cost saving in these six aspects create competitive advantage.	research : India	Venkatesan (2022)
	SERQUAL (service quality model) and OEM (organizational effectiveness model) used as two sets of dimensions to derive performance criteria. 3PL customers in Moroccan market prize financial performance and reputation of 3PLs very highly. In contrast, according to the study, in more matured 3PL markets such as the advanced economies 3PL customers find cost of service and service quality to be most important in selecting third party logistics companies. The criteria, model, weighting, and ranking are laid out in the merged table below.	Country of research : Morocco	Akaaboune et al. (2018)
Model	Criteria	Weight	Rank
OEM	Financial performance	12.20%	1
OEM	Reputation	12.20%	1

OEM	Cycle time	11.84%	3
SERVQUAL	Empathy	11.75%	4
SERVQUAL	Tangible	10.16%	5
OEM	Productivity	9.23%	6
SERVQUAL	Reliability	8.75%	7
OEM	Customer service	8.43%	8
SERVQUAL	Responsiveness	8.12%	9
SERVQUAL	Assurance	7.31%	10
Levels of logistics outsourcing in selected developing country regions	Logistics outsourcing is moderately penetrated, practiced or used among Indian manufacturing firms	Country of research : India	Gorane and Kant (2016)
	The choices firms make in terms of the level of sophisticated logistics functions that are outsourced are correlated with different factors from country to country	Country of research : Mexico & Brazil	Tibbetts (2015)
	Findings show that most African countries have high logistics cost as a percentage of GDP (except Egypt) which indicates inefficient processes and low third-party logistics revenue as a percentage of logistics costs (except South Africa) which indicate low usage of third-party logistics services. African total average logistics costs are 14.3% of GDP and total average third party logistics revenue is 8.1% of logistics costs.	African region	Armstrong & Associates (2022)

	Nigeria has the highest logistics cost and the lowest third-party logistics revenue as a percentage of logistics costs.		
	Positive correlation between logistics outsourcing (transportation outsourcing) and oil and gas projects and a weak positive correlation between inventory management outsourcing and oil and gas projects.	Country of research : Kenya	Machari a et al. (2016)
	Study acknowledged that not much has been researched in logistics outsourcing in emerging countries such as Nigeria. International Oil & Gas companies implement third party logistics unsystematically, partially, bit by bit.	Country of research : Nigeria	Etokudo h et al. (2017)
Comparison of third-party logistics practice between selected developed and developing regions of the world	Logistics outsourcing is a common practice among large firms in Mexico, however on a low-profile practice. Firms in Europe and USA use third party logistics higher than Mexican firms as these firms in the USA and Europe use 3PL services for more tactical (strategic) and integrated functions while also focusing on cost reduction but firms in Mexico outsource more core logistics functions.	Regions of research : Mexico, USA, and Europe	Arroyo et al. (2006)
	3PLs customers from advanced countries such as Germany, France, Denmark, Switzerland, Spain, and Portugal are more concerned about cost (i.e., cost of service and reduction in logistics costs) and quality of service. On the other hand, 3PL customers in	Country of research : Morocco	Akaabou ne et al. (2018)

	Morocco are more concerned about the financial performance and the reputation of 3PL firms for selection of 3PLs		

Appendix 2: questionnaire and interview questions

2A: Structured interview minutes

Notes from interview with the pharmaceutical company

How many states in Nigeria does your organization operate? – 24 states

What are your organization's core activities? – Manufacturing of pharmaceutical products

How would you describe the level of your organization's logistics activities/operations?

Heavy logistics operations/activities? - Yes

Medium level of logistics operations/activities? - No

Low level of logistics operations/activities? - No

Is your organization engaged in logistics outsourcing activities? - Yes

If the answer is yes how long has it been? – Over 30yrs

Were they breaks at any point? - No

Is your organization outsourcing all their logistics activities to third party logistics companies or some logistics activities? If the latter is the answer what logistics activities are outsourced? – All transport and distribution related logistics activities are outsourced to third party logistics companies

Notes from interview with Agriculture1

How many states in Nigeria does your organization operate? Production of vital feeds are done in 4 major cities in Nigeria, but supply of the products is made to 36 states.

What are your organization's core activities? Production of vital feeds for poultry and fish farming and production of soya oil made from soya beans.

How would you describe the level of your organization's logistics activities/operations? Heavy logistics operations/activities? Heavy logistics operations

Medium level of logistics operations/activities?

Low level of logistics operations/activities?

Is your organization engaged in logistics outsourcing activities? Yes

If the answer is yes how long has it been? Not sure but over a decade ago

Were they breaks at any point? No

Is your organization outsourcing all their logistics activities to third party logistics companies or some logistics activities? If the latter is the answer what logistics activities are outsourced? Some such as customer service, warehousing, and outbound logistics (delivery)

Notes from interview with Agriculture2

How many states in Nigeria does your organization operate? All states

What are your organization's core activities? Agricultural activities, live stocks and plant farms, poultry food productions and products such as rice and flour.

How would you describe the level of your organization's logistics activities/operations? Is it heavy logistics operations/activities? Heavy logistics operations

Is it medium level of logistics operations/activities?

Is it low level of logistics operations/activities?

Is your organization engaged in logistics outsourcing activities? Yes

If the answer is yes how long has it been? Not ascertain but many years

Were they breaks at any point? There were no breaks at any points however the level of logistics activities has reduced at some points depending on the seasons.

Is your organization outsourcing all their logistics activities to third party logistics companies or some logistics activities? If the latter is the answer what logistics activities are outsourced? All logistics activities are outsourced, however storage (warehousing), inbound (picking up goods from manufacturers or suppliers) and outbound logistics (that is delivery to end customers) are the three major logistics activities outsourced.

Notes from interview with FMCG

How many states in Nigeria does your organization operate? 36 states

What are your organization's core activities? Manufacturing (fast moving consumer goods)

How would you describe the level of your organization's logistics activities/operations? Heavy logistics operations/activities? Yes

Medium level of logistics operations/activities?

Low level of logistics operations/activities?

Is your organization engaged in logistics outsourcing activities? Yes

If the answer is yes how long has it been? Over 10 years

Were they breaks at any point? No

Is your organization outsourcing all their logistics activities to third party logistics companies or some logistics activities? If the latter is the answer what logistics activities are outsourced? Some logistics, Transportation, and distribution

Notes from interview with Manufacturing

How many states in Nigeria does your organization operate? 2 states

What are your organization's core activities? Manufacturing

How would you describe the level of your organization's logistics activities/operations? Heavy logistics operations/activities? Yes

Medium level of logistics operations/activities?

Low level of logistics operations/activities?

Is your organization engaged in logistics outsourcing activities? Yes

If the answer is yes how long has it been? 7 years

Were they breaks at any point? No

Is your organization outsourcing all their logistics activities to third party logistics companies or some logistics activities? If the latter is the answer what logistics activities are outsourced?

Inbound and outbound logistics and transportation and distribution

2B: Likert Scale questionnaire

Logistics outsourcing & performance: In the scale of 1-5 how would you rate the performance of each of these areas of logistics outsourcing activity in the table below?

Logistics activity	Extremely low (1)	Low (2)	Neutral (3)	High (4)	Extremely high (5)	N/A
Transportation and distribution of goods to warehouses, storage facilities and outlets						
Inbound logistics (picking up goods from manufacturers or suppliers)						

Outbound logistics (delivery to customers)						
Warehousing						
IT (such as tracking)						
Customer service						
Inventory management						
Order processing						
Packaging						
Material handling						

Where 1 is extremely low performance and 5 is extremely high performance. Indicate N/A where not applicable.

Level of logistics outsourcing: To what level does your organization outsource their logistics?

Logistics activities	No activity- 0	Low level- 1 (25%)	Partial- 2 (50%)	High level- 3 (75%)	All activities- 4 (100%)
Transportation and distribution within organization					
Inbound logistics (picking up goods from manufacturers/suppliers or sourcing)					
Outbound logistics (delivery to customers)					
Warehousing					
IT (tracking)					
Customer service					
Inventory management					
Order processing					
Material handling					
Packaging					

Logistics outsourcing and cost efficiency: on a scale of 0-4 how would you rate the effect of outsourcing the following logistics activities on cost efficiency of your firm's operations cost. Where 0 is no cost savings and 4 is high-cost savings

Logistics activities	0 (no cost savings)	1 low-cost saving (1-10%)	2 medium cost saving (11-25%)	3 High-cost saving (26%-40)	4 Very high-cost saving (41% above)
Transportation and distribution to warehouses, storage facilities and outlets					
Inbound logistics (pick up from manufacturers/suppliers or sourcing)					
Outbound logistics (deliveries)					
Warehousing					
IT (Tracking)					
Customer service					
Inventory management					
Order processing					
Packaging					
Material handling					

Use of advanced technologies (by 3PLs) and its effect on operational efficiency and customer satisfaction: on a scale of 0-5 where 0 means that the 3PL company do not use advanced technologies and where 5 mean that you strongly agree that the use of modern technologies by 3PL positively affects operational efficiency and customer service.

Impact of advanced technology	No use of advanced technology (0)	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Operational efficiency- Cost saving and responsiveness						
Customer service- Customer satisfaction (customer retention and customer loyalty)						

2C: Semi-structured interview questions

Pharmaceutical company

1. Your answer to the questionnaire indicates that the following logistics activities are not outsourced: IT (e.g. tracking), Customer service, Inventory management, Order processing, Packaging, Material handling. What are the reasons for zero outsourcing of the aforementioned logistics activities?

2. Follow-up question from question 1: These activities above are not a core part of your business how come they are still not outsourced?

3. What are the factors that will make outsourcing of these activities more attractive?

Agriculture company1

1. Your answer to the questionnaire indicates that the following logistics activities are not outsourced: Inbound logistics, Inventory management, Order processing, Material handling, Packaging. What are the reasons for zero outsourcing of the aforementioned logistics activities?

2. What are the factors that will make outsourcing of these activities more attractive?

Agriculture company2

1. Your answer to the questionnaire indicates that the following logistics activities are not outsourced: inventory management, order processing, and materials management. Whatare the reasons for zero outsourcing of the aforementioned logistics activities?

Appendix 3: statistical t-test

Definition of terms (statistical t-test)

Null hypothesis: The null hypothesis is that the mean $\dot{X}$ of variable one (logistics activity) is not statistically significant from the mean $\dot{X}$ of variable two hence $H_0: \mu = \dot{X}$

Alternate hypothesis: Alternate hypothesis is that the mean X of variable one (logistics activity) is statistically significant from the mean Ẋ of variable two hence Ḥ: μ ≠ Ẋ.

Statistical significance: when the t-test show statistical significance then it means that the results are not by chance. Hence, the p value at 0.05 or less gives 95% or more confidence that the results are true and not by coincidence, hence rejecting the null hypothesis.

Significant level: The significant value for each T-test is set at 0.05 or less which means that the null hypothesis is rejected when the p value at second tail is ≤ 0.05.

Two tail T-test: is used to give room for the possibility of both a positive and a negative p-value that is less than 0. The p-value at extreme case of each tail added together is supposed to be ≤0.05 to be statistically significant.

Appendix 4: Content analysis

List of selected papers from second search

No.	Paper title	Author(s)	Year of publication
1.	Factors influencing information and communication technology diffusion in Nigeria's transport logistics industry: an exploratory study	Ezenwa et al.	2020
2.	Restraining forces and drivers of supply chain collaboration: evidence from an emerging market	Oyedijo et al.	2022

3.	The murky waters of outsourcing: critical risks factors of outsourcing pharmaceutical outbound value chains.	Aigbavboa and Mbohwa	2020
4.	The headache of medicines' supply in Nigeria: an exploratory study on the most critical challenges of pharmaceutical outbound value chains.	Aigbavboa and Mbohwa	2020
5.	DEA-Driven Risk Management Framework for Optimising Supply Chain Strategies in the Nigerian Oil Industry	Hatami-Marbini et al.	2024
6.	Analysis of risks associated with facilities management outsourcing: A multivariate approach	Ikediashi et al.	2012

Appendix 5: correlation analysis

5A: Further justification for classifying high income countries as developed economies compared to middle income economies.

According to World Bank data, the high-income countries have the following average social indicators:

- Poverty headcount ratio: 0.6% (2019)

- Life expectancy at birth: 80 years (2020)
- Population growth: -0.00 (2021)
- Total population is 1.24 billion (2021)
- Net migration is 2,128,855 (2021).

Some selected economic indicators are as follows:

- GDP per capita: $48,225.2 (2021)
- Average annual GDP growth: 5.2% (2021)
- Average unemployment rate: 5.6% (2021)
- Average inflation, consumer prices: 2.5% (2021)
- Total GDP: $59.83 trillion (2021)
- Personal remittances: 0.3% of GDP (2021)

Other indicators include:

- Access to electricity: 100% (2020)
- Annual freshwater withdrawals % of total internal resources: 9% (2019)
- People using safely managed sanitation services: 87% (2020)
- Individuals using internet: 89% (2020)
- Foreign direct investment % of GDP: 2.3% (2021)
- Central government debt % of GDP: 131.5% (2021)

Lower middle-income countries have the following average social indicators:

- Poverty headcount ratio: 10.2% (2019)
- Total life expectancy at birth: 69 (2020)
- Population growth: 1.2% (2021)
- Total population: 3.4 billion (2021)
- Net migration: -1,444,849 (2021)

Some selected economic indicators include:

- Total GDP: $8.74 trillion (2021)
- GDP per capita: $2,572.7 (2021)
- Average GDP growth: 5.6% (2021)
- Unemployment rate: 6.5% (2021)
- Inflation, consumer prices: 4.7% (2021)
- Personal remittances received (% of GDP): 4.5% (2021)

Other indicators include:

- Access to electricity (% of population): 90.1% (2020)
- Annual freshwater withdrawals (% of total internal resources): 18% (2019)
- People using safely managed sanitation service (% of population): 46% (2020)
- People using the internet (% of population): 45% (2020)
- Foreign direct investment net inflows: 1.7% (2021)
- Central government (% of GDP): No available data

5B: The selection process of developing and developed countries included in the correlation analysis.

Fifty countries were selected. These countries have significant GDPs and significant logistics costs. More countries would have been selected but fewer developing countries are represented in the data from Armstrong and Associates compared to developed countries hence the total number of selected developed countries was reduced to equate with developing countries.

This research aimed at including countries whose third-party logistics market were studied in the literature review and are also represented in the data from Armstrong and Associates in the selection. However, some countries like Bulgaria, Slovenia, Czech Republic, Tunisia, Mozambique, Ghana, and Kenya were studied in the literature review but not represented in the data from Armstrong & Associates (2022), hence these countries are not included. This reduced the number of selected countries from each group to twenty-five instead of thirty each. After countries were selected from the Armstrong and Associates data based on the literature review, the remaining countries were selected from the Armstrong and Associates data based on the size of their GDP and logistics cost to represent a very substantial portion of the population. Finally, countries were selected to fairly represent a good spread of the global economy by having a good representation of the various geographical and economic regions.

List of selected developing countries' GNI:

No.	Country	Region	GNI per capita
1.	Algeria	Africa	$3,660
2.	Argentina	South America	$9,960
3.	Bangladesh	South Asia Pacific	$2,570

4.	Brazil	South America	$7,740
5.	China	South Asia Pacific	$12,850
6.	Columbia	South America	$6190
7.	Egypt	Africa	$3,350
8.	India	South Asia Pacific	$2,150
9.	Indonesia	South Asia Pacific	$4,180
10.	Iran	Middle East	$3,530
11.	Kazakhstan	CIS (Eastern Europe)	$8,880
12.	Malaysia	South Asia Pacific	$10,710
13.	Mexico	South America	$9,590
14.	Morocco	Africa	$3,620
15.	Nigeria	Africa	$2080
16.	Pakistan	Middle East	$1,470
17.	Philippines	South Asia Pacific	$3,550
18.	Peru	South America	$6,480
19.	Russia	CIS Eastern Europe	$12,830
20	Sri Lanka	South Asia Pacific	$4,030
21	South Africa	Africa	$6,530
22	Sudan	Africa	$650
23	Thailand	South Asia Pacific	$7,090
24	Ukraine	CIS (Eastern Europe)	$4,120
25	Vietnam	South Asia Pacific	$3,590

List of selected developed countries' GNI:

No.	Country	Region	GNI
1.	Australia	South Asia Pacific	$57,170
2.	Canada	North America	$48,310
3.	Chile	South America	$14,780
4.	Denmark	Europe	$68,300
5.	Finland	Europe	$53,510
6.	France	Europe	$44,160
7.	Germany	Europe	$51,660
8.	Hong Kong	South Asia Pacific	$54,460
9.	Ireland	Europe	$76,110
10.	Israel	Middle East	$49,290
11.	Italy	Europe	$35,990
12.	Japan	South Asia Pacific	$42,650
13.	Netherlands	Europe	$55,200
14.	New Zealand	South Asia Pacific	$45,230
15.	Norway	Europe	$83,880
16.	Poland	Europe	$16,850
17.	Spain	Europe	$29,690
18.	Singapore	South Asia Pacific	$64,010
19.	South Korea	South Asia Pacific	$35,110
20.	Sweden	Europe	$59,540
21.	Switzerland	Europe	$90,600
22.	Taiwan	South Asia Pacific	$34,756 (Shih-Ching Taipei Times, 2023)

23.	UAE	Middle East	$41,770 (2020)
24.	United Kingdom	Europe	$44,480
25.	United States of America	North America	$70,930

List of selected developing countries' 3PL revenues as a percentage of logistics costs and logistics costs as a percentage of GDP

No.	Country	Region	3PL revenues as a percentage of logistics cost	Logistics cost as a percentage of GDP
1.	Algeria	Africa	7.9	16.5
2.	Argentina	South America	9.3	12.0
3.	Bangladesh	South Asia Pacific	8.3	15.6
4.	Brazil	South America	9.4	11.6
5.	China	South Asia Pacific	10.6	14.5
6.	Columbia	South America	8.6	12.5
7.	Egypt	Africa	8.6	8.3
8.	India	South Asia Pacific	7.4	13.0
9.	Indonesia	South Asia Pacific	7.7	22.0
10.	Iran	Middle East	8.1	16.2
11.	Kazakhstan	CIS (Eastern Europe)	8.5	15.1
12.	Malaysia	South Asia Pacific	7.5	13.0
13.	Mexico	South America	10.8	12.0

14.	Morocco	Africa	8.5	15.0
15.	Nigeria	Africa	7.4	16.1
16.	Pakistan	Middle East	8.3	15.6
17.	Philippines	South Asia Pacific	7.4	13.0
18.	Peru	South America	8.8	12.5
19.	Russia	CIS Eastern Europe	8.1	16.1
20.	Sri Lanka	South Asia Pacific	7.1	18.7
21.	South Africa	Africa	10.4	10.9
22.	Sudan	Africa	7.6	17.5
23.	Thailand	South Asia Pacific	7.7	15.0
24.	Ukraine	CIS (Eastern Europe)	8.2	15.9
25.	Vietnam	South Asia Pacific	7.9	20.0

List of selected developed countries' 3PL revenues as a percentage of logistics costs and logistics costs as a percentage of GDP

No.	Country	Region	3PL revenue % of logistics cost	Logistics cost as a % of GDP
1.	Australia	South Asia Pacific	10.6	8.6
2.	Canada	North America	10.6	9.0
3.	Chile	South America	9.8	11.5
4.	Denmark	Europe	10.5	8.8
5.	Finland	Europe	10.7	8.4
6.	France	Europe	10.5	8.8
7.	Germany	Europe	10.5	8.1

8.	Hong Kong	South Asia Pacific	11.5	8.5
9.	Ireland	Europe	11.8	7.7
10.	Israel	Middle East	9.9	11.3
11.	Italy	Europe	10.3	9.0
12.	Japan	South Asia Pacific	10.9	8.5
13.	Netherlands	Europe	14.6	7.4
14.	New Zealand	South Asia Pacific	9.9	11.2
15.	Norway	Europe	10.3	8.9
16.	Poland	Europe	10.2	10.1
17.	Spain	Europe	10.2	8.2
18.	Singapore	South Asia Pacific	12.0	8.5
19.	South Korea	South Asia Pacific	11.5	9.0
20.	Sweden	Europe	10.4	7.8
21.	Switzerland	Europe	10.5	8.3
22.	Taiwan	South Asia Pacific	11.3	9.0
23.	UAE	Middle East	10.3	10.0
24.	United Kingdom	Europe	9.8	8.5
25.	United States of America	North America	13.8	8.0

Appendix 6: Third-party logistics decision support framework questionnaire filled by a participant

DTM

Distribution and Transportation management within your organisation (i.e., transportation between your warehouse and outlet or factory and warehouse or outlet)

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks, challenges, and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Employees' reluctance to work with 3PL staff and problems related to staff changes. • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors	15/35
Indirect cost: Internal competencies including significant financial and non-financial investments, assets (that your company will need to sell at reduced value), trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	10/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage) only award scores if this activity is part of your core business or is related to your core business	10/20
Social-economic and infrastructural limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Congested road networks and ports	10/20

• High rate of traffic accidents • Security issues such as smuggling and robbery. • Uncertain business environment	
Total score	45

Warehouse

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	15/35
indirect cost: Internal competencies including significant financial and non-financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship and agency costs	10/25

Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage) only allocate score if this activity is part of your organisation's core business activity or if it is related to your organisation's core business activity	10/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Uncertain business environment	10/20
Total score	45

Outbound logistics- Last mile delivery to final consumers

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks, challenges, and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Employees' reluctance to work with 3PL staff and problems related to staff changes. • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors	25/35

Indirect cost: Internal competencies including significant financial and non-financial investments, assets (that your company will need to sell at reduced value), trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	15/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage) only award scores if this activity is part of your core business or is related to your core business	/20
Social-economic and infrastructural limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Congested road networks and ports • High rate of traffic accidents • Security issues such as smuggling and robbery. • Uncertain business environment	15/20
Total score	55

Inbound logistics

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks, challenges, and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty	20/35

• Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Employees' reluctance to work with 3PL staff and problems related to staff changes. • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors	
Indirect cost: Internal competencies including significant financial and non-financial investments, assets (that your company will need to sell at reduced value), trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	15/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage) only award scores if this activity is part of your core business or is related to your core business	/20
Social-economic and infrastructural limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Congested road networks and ports • High rate of traffic accidents • Security issues such as smuggling and robbery. • Uncertain business environment	10/20
Total score	45

IT (Information technology such as tracking)

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	15/35
indirect cost: Internal competencies including significant financial and non-financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship and agency costs	10/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage) only allocate score if this activity is part of your organisation's core business activity or if it is related to your organisation's core business activity	10/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market.	10/20

• Uncertain business environment	
Total score	45

Customer service

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	15/35
indirect cost: Internal competencies including significant financial and non-financial investments, assets, trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	10/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage) only allocate score if this activity is part of your organisation's core business activity or if it is related to your organisation's core business activity	10/20

Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Uncertain business environment	10/20
Total score	45

Material handling

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	20/35
indirect cost: Internal competencies including significant financial and non-financial investments, assets, trained logistics personnel, search and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship and agency costs	10/25

Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage) only allocate score if this activity is part of your organisation's core business activity or if it is related to your organisation's core business activity	10/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Uncertain business environment	10/20
Total score	50

Packaging

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors • Employees' reluctance to work with 3PL staff and problems related to staff changes	15/35

indirect cost: Internal competencies including significant financial and non-financial investments, assets, trained logistics personnel, search and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship and agency costs	15/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage) only allocate score if this activity is part of your organisation's core business activity or if it is related to your organisation's core business activity	10/20
Social-economic limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Uncertain business environment	10/20
Total score	50

Inventory management

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks, challenges, and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions	20/35

• Employees' reluctance to work with 3PL staff and problems related to staff changes. • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors	
Indirect cost: Internal competencies including significant financial and non-financial investments, assets (that your company will need to sell at reduced value), trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	10/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage) only award scores if this activity is part of your core business or is related to your core business	10/20
Social-economic and infrastructural limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market. • Congested road networks and ports • High rate of traffic accidents • Security issues such as smuggling and robbery. • Uncertain business environment	10/20
Total score	50

Order management

Costs (indirect costs and opportunity costs) and potential risks	Scores
Risks, challenges, and barriers: • Differences in organizational cultures • Joint venture partnership intervention • Corruption and dishonesty • Change in your organization's management. • Poor vendor or 3PL capability • Underpayment of staffs by 3PLs and unfavourable working conditions • Employees' reluctance to work with 3PL staff and problems related to staff changes. • Poor information flow management/risk and exposure of 3PL's customer secrets to competitors	15/35
Indirect cost: Internal competencies including significant financial and non-financial investments, assets (that your company will need to sell at reduced value), trained logistics personnel, search, and information costs, bargaining or negotiations costs, policy and enforcement costs, cost of adaptation, relationship, and agency costs	10/25
Opportunity cost: Internal Core business or core competencies (i.e., source of organisation's competitive advantage) only award scores if this activity is part of your core business or is related to your core business	10/20
Social-economic and infrastructural limitations: • Inadequate regulations of the Nigerian third-party logistics industry • High cost of business operations • Underdeveloped third party logistics business market.	10/20

• Congested road networks and ports • High rate of traffic accidents • Security issues such as smuggling and robbery. • Uncertain business environment	
Total score	45

Benefits of logistics outsourcing

Logistics activity	Cost savings/reduction in capital investments- 30	Focus on core competence- 30	Risk sharing- 15	Access to 3PL expertise/competence and resources- 15	Improved service delivery - 10	Total score
DTM	10	10	5	5	5	35
Warehousing	10	10	5	5	4	34
Last mile delivery	20	25	10	10	7	72
Inbound logistics	10	10	5	5	4	34
IT (e.g., tracking)	15	15	8	8	5	51
Customer service	10	10	5	5	4	34

Material handling	10	5	5	5	4	29
Packaging	5	3	3	3	4	18
Inventory management	10	10	7	5	5	37
Order management	5	5	5	5	5	25

Allocated ratios

Ratio	Interpretation	Allocated logistics activities	Decision
1:1	This mean that the total scores awarded to the benefits of outsourcing must be at least equal to the cost and risks	Last mile delivery	Amber, anything less than this ratio is red
11:10	This means that the total scores awarded to the benefits of outsourcing must exceed the costs and risk by a minimum of 10%	Last mile delivery	Green, anything less than this ratio is amber
11:10	This means that the total scores awarded to the benefits	DTM and warehousing	Amber, anything less than this ratio is red

	must exceed the cost and risks by a minimum of 10%		
6:5	This means that the total scores awarded to the benefits must exceed the cost and risks by a minimum of 20%	DTM and warehousing	Green, anything less than this ratio is amber
6:5	This means that total scores awarded to the benefits of outsourcing a particular logistics activity must exceed the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 20%.	Inbound logistics and IT	Amber, anything less than this ratio is red
13:10	This means that total scores awarded to the benefits of outsourcing a particular logistics activity must exceed the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 30%	Inbound logistics and IT	Green, anything less than this ratio is amber
13:10	This means that the total scores awarded to the benefits of outsourcing a particular	Customer service, material handling and packaging	Amber, anything less than this ratio is red

	logistics activity must exceed the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 30%		
7:5	This means that the total scores awarded to the benefits of outsourcing a particular logistics activity must exceed the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 40%	Customer service, material handling and packaging	Green, anything less than this ratio is amber
7:5	This means that total scores awarded to the benefits of outsourcing a particular logistics activity must exceed the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 40%	Inventory management and order management	Amber, anything less than this ratio is red
3:2	This means that total scores awarded to the benefits of outsourcing a particular logistics activity must exceed	Inventory management and order management	Green, anything less than this ratio is amber

	the total scores allocated to the costs/risks of outsourcing the same logistics activity by a minimum of 50%		

Decision whether to outsource or not

Logistics activity	Benefits/rewards total score	Costs/risks total score	Ratio and percentage of benefits to costs	Apply allocated ratio	Decision
DTM	35	45	35:45= 77%	6:5= 120%	Keep in-house
Last mile delivery	72	55	72:55= 130%	11:10= 110%	Outsource
Warehousing	34	45	34:45= 75%	6:5= 120%	Keep in-house
Inbound logistics	34	45	34:45= 75%	13:10= 130%	Keep in-house
IT	51	45	51:45= 113%	13:10= 130%	Keep in-house
Customer service	34	45	34:45= 75%	7:5= 140%	Keep in-house
Material handling	29	50	29:50= 58%	7:5= 140%	Keep in-house

Packaging	18	50	18:50= 36%	7:5= 140%	Keep in-house
Inventory management	37	50	37:50= 74%	8:5= 160%	Keep in-house
Order management	25	45	25:45= 55%	8:5= 160%	Keep in-house